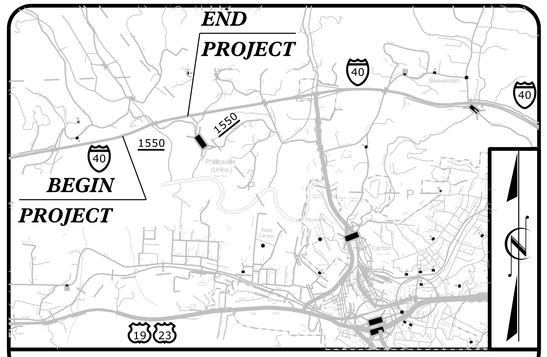
TIP PROJECT: HB–0003

CONTRACT: C204884



VICINITY MAP

See Sheet 1-A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

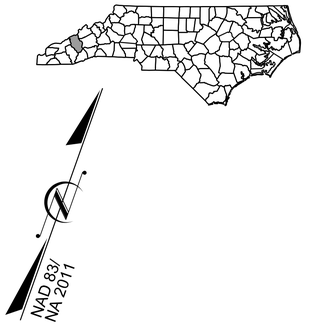
HAYWOOD COUNTY

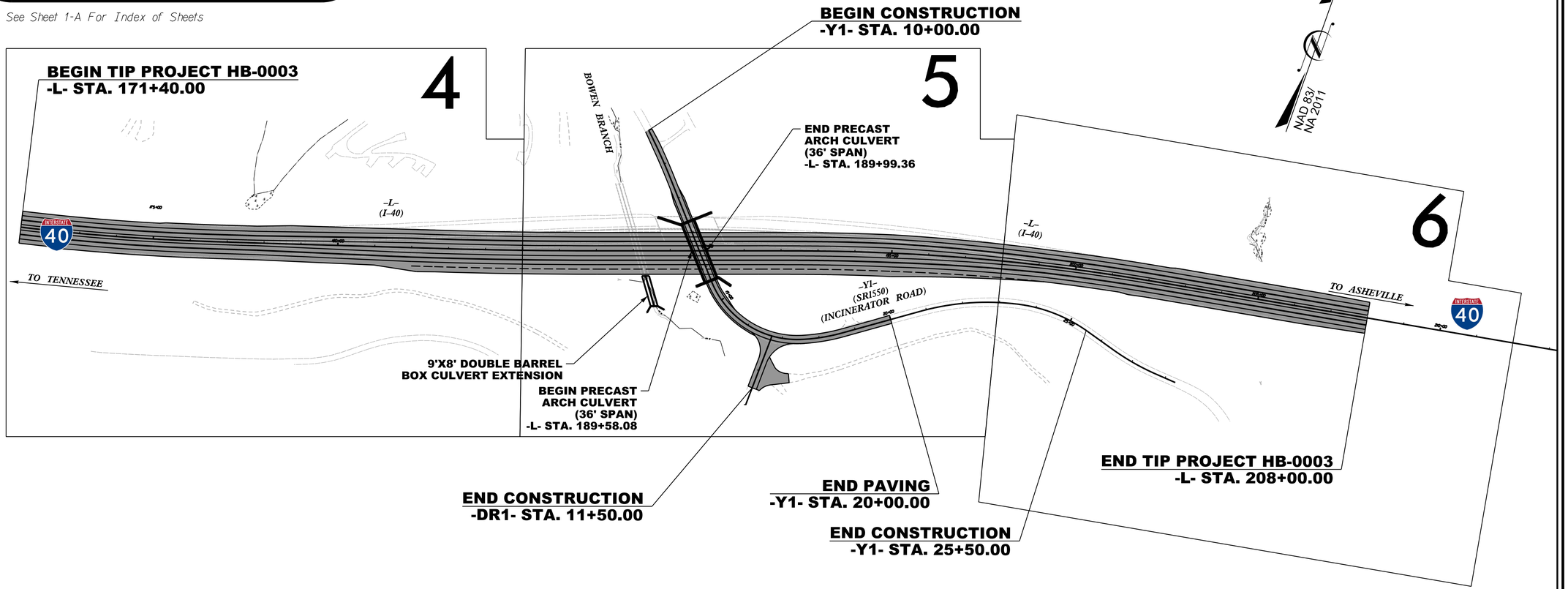
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HB–0003	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49623.1.1		PE
49623.2.1		R/W
49623.2.2		UTIL.
49623.3.1		CONST.

LOCATION: *I–40 FROM 0.348 MILES WEST OF SR 1550 (INCINERATOR ROAD) TO 0.345 MILES EAST OF SR 1550 (INCINERATOR ROAD)*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, CULVERT, AND RETAINING WALLS.*

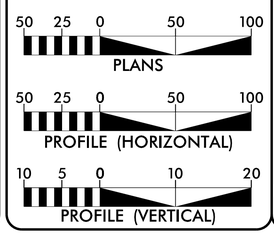




THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2024 = 58,800
ADT 2045 = 82,900
K = 8 %
D = 55 %
T = 20 % *
V = 70 MPH
* TTST = 16% DUAL = 4%

FUNC. CLASS = INTERSTATE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT HB–0003	=	0.685 MILES
LENGTH STRUCTURE TIP PROJECT HB–0003	=	0.008 MILES
TOTAL LENGTH TIP PROJECT HB–0003	=	0.693 MILES

Prepared in the Office of:
WETHERILL ENGINEERING
1223 Jones Franklin Rd. Raleigh, N.C. 27606
License No. F-0377
Bus: 919.851.8077 Fax: 919.851.8107

Prepared for:
DIVISION OF HIGHWAYS DIVISION 14
253 Webster Road Sylva NC, 28779

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 14, 2023

LETTING DATE: JULY 16 , 2024

GREG PURVIS, PE
PROJECT ENGINEER

JONATHAN HEFNER, PE
PROJECT DESIGN ENGINEER

NCDOT CONTACT: ZACH SHULER
DIVISION 14 BRIDGE PROGRAM MANAGER

HYDRAULICS ENGINEER 6/11/2024
DocuSigned by: Matthew L. Harvey DB419C2087B94EE...
NORTH CAROLINA PROFESSIONAL SEAL 053425 ENGINEER MATTHEW L. HARVEY

ROADWAY DESIGN ENGINEER 6/11/2024
DocuSigned by: Jonathan C. Hefner 02BB9ADB7E0E478...
NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER JONATHAN C. HEFNER

STATE OF NORTH CAROLINA * DEPARTMENT OF TRANSPORTATION *

6/11/2024
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USER:JHefner

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	1A

ROADWAY DESIGN ENGINEER

5/14/2024

NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER JONATHAN C. HEFNER

DocuSigned by: Jonathan C. Hefner

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INDEX OF SHEETS

2024 ROADWAY ENGLISH STANDARD DRAWINGS

EFF. 01-16-2024
REV.

2024 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Contracts Standards and Development Unit -N. C. Department of Transportation - Raleigh, N. C., Dated January 16, 2024 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO. TITLE

DIVISION 2 - EARTHWORK

200.03 Method of Clearing - Method III
225.01 Guide for Grading Subgrade - Interstate and Freeway
225.02 Guide for Grading Subgrade - Secondary and Local
225.04 Method of Obtaining Superelevation - Two Lane Pavement
225.05 Method of Obtaining Superelevation - Divided Highways
235.01 Embankment Monitoring

DIVISION 3 - PIPE CULVERTS

300.01 Method of Pipe Installation

DIVISION 5 - SUBGRADE, BASES AND SHOULDERS

560.01 Method of Shoulder Construction - High Side of Superelevated Curve - Method I
560.02 Method of Shoulder Construction - High Side of Superelevated Curve - Method II

DIVISION 6 - ASPHALT BASES AND PAVEMENTS

665.01 Asphalt Shoulders - Milled Rumble Strips

DIVISION 8 - INCIDENTALS

806.01 Concrete Right-of-Way Marker
806.02 Granite Right-of-Way Marker
815.02 Subsurface Drain
838.01 Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11 Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
840.00 Concrete Base Pad for Drainage Structures
840.04 Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05 Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.17 Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18 Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.20 Frames and Wide Slot Flat Grates
840.22 Frames and Wide Slot Sag Grates
840.25 Anchorage for Frames - Brick or Concrete or Precast
840.26 Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27 Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.31 Concrete Junction Box - 12" thru 66" Pipe
840.32 Brick Junction Box - 12" thru 66" Pipe
840.34 Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.36 Traffic Bearing Grated Drop Inlet - for Steel (840.37) Double Frame and Grates
840.37 Steel Grate and Frame
840.41 Spring Box - Concrete or Brick
840.45 Precast Drainage Structure
840.46 Traffic Bearing Precast Drainage Structure
840.54 Manhole Frame and Cover
840.55 Manhole Frame and Cover (Flush with Slab for Open Throat Catch Basin)
840.66 Drainage Structure Steps
840.72 Pipe Collar
846.01 Concrete Curb, Gutter and Curb & Gutter
846.04 Drop Inlet Installation in Shoulder Berm Gutter
850.01 Concrete Paved Ditches
857.01 Precast Reinforced Concrete Barrier - 41" Single Faced
862.01 Guardrail Placement
862.02 Guardrail Installation
862.03 Structure Anchor Units
862.04 Anchoring End of Guardrail - for B-77 and B-83 Anchor Units
866.02 Woven Wire Fence - with Wood Post
867.01 Steel Pipe Gate
876.01 Rip Rap in Channels and Ditches
876.02 Guide for Rip Rap at Pipe Outlets
876.04 Drainage Ditches with Class 'B' Rip Rap

GENERAL NOTES

GENERAL NOTES:

2024 SPECIFICATIONS
EFFECTIVE: 01-16-2024
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 & STD. NO. 225.05 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01 & STD. NO. 560.02.

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

ATT (COMMUNICATIONS), NCDOT(COMMUNICATIONS),
DUKE ENERGY (ELECTRIC), HAYWOOD ELECTRIC MEMBERSHIP CORP (POWER)
PACTIV EVERGREEN PAPER PLANT (SEWER)

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP) — EIP
- Computed Property Corner
- Existing Concrete Monument (ECM) — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Secondary Horiz and Vert Control Point
- Vertical Benchmark
- Existing Right of Way Monument
- Proposed Right of Way Monument (Rebar and Cap)
- Proposed Right of Way Monument (Concrete)
- Existing Permanent Easement Monument
- Proposed Permanent Easement Monument (Rebar and Cap)
- Existing C/A Monument
- Proposed C/A Monument (Rebar and Cap)
- Proposed C/A Monument (Concrete)
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Existing Control of Access Line — CA
- Proposed Control of Access Line — CA
- Proposed ROW and CA Line — RW CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage/Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge

- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

** SUE – Subsurface Utility Engineering*
LOS – Level of Service – A,B,C or D (Accuracy)

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — HH
- H–Frame Pole
- U/G Power Line Test Hole (SUE – LOS A)*
- U/G Power Line (SUE – LOS B)* — P
- U/G Power Line (SUE – LOS C)* — P
- U/G Power Line (SUE – LOS D)* — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- U/G Telephone Test Hole (SUE – LOS A)*
- U/G Telephone Cable (SUE – LOS B)* — T
- U/G Telephone Cable (SUE – LOS C)* — T
- U/G Telephone Cable (SUE – LOS D)* — T
- U/G Telephone Conduit (SUE – LOS B)* — TC
- U/G Telephone Conduit (SUE – LOS C)* — TC
- U/G Telephone Conduit (SUE – LOS D)* — TC
- U/G Fiber Optics Cable (SUE – LOS B)* — T FO
- U/G Fiber Optics Cable (SUE – LOS C)* — T FO
- U/G Fiber Optics Cable (SUE – LOS D)* — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line Test Hole (SUE – LOS A)*
- U/G Water Line (SUE – LOS B)* — W
- U/G Water Line (SUE – LOS C)* — W
- U/G Water Line (SUE – LOS D)* — W
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Test Hole (SUE – LOS A)*
- U/G TV Cable (SUE – LOS B)* — TV
- U/G TV Cable (SUE – LOS C)* — TV
- U/G TV Cable (SUE – LOS D)* — TV
- U/G Fiber Optic Cable (SUE – LOS B)* — TV FO
- U/G Fiber Optic Cable (SUE – LOS C)* — TV FO
- U/G Fiber Optic Cable (SUE – LOS D)* — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line Test Hole (SUE – LOS A)*
- U/G Gas Line (SUE – LOS B)* — G
- U/G Gas Line (SUE – LOS C)* — G
- U/G Gas Line (SUE – LOS D)* — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Force Main Line Test Hole (SUE – LOS A)*
- SS Force Main Line (SUE – LOS B)* — FSS
- SS Force Main Line (SUE – LOS C)* — FSS
- SS Force Main Line (SUE – LOS D)* — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line (SUE – LOS B)* — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

ROADWAY DESIGN ENGINEER 5/14/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35016 JONATHAN C. HEFNER — DocuSigned by: Jonathan C. Hefner

PAVEMENT DESIGN ENGINEER 5/14/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024964 JOSEPH T. HOLLAND — DocuSigned by: Joseph T. Holland

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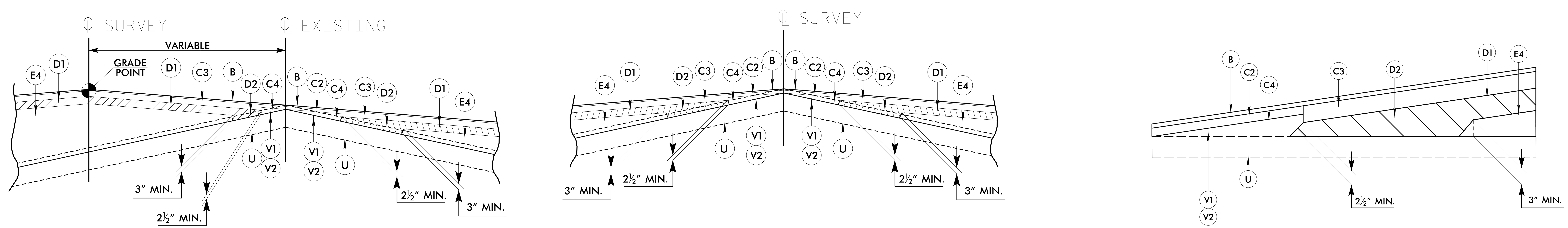
FINAL PAVEMENT SCHEDULE

B	PROP. APPROX. ¾" OPEN-GRADED ASPHALT FRICTION COURSE, TYPE FC-1 MODIFIED, AT AN AVERAGE RATE OF 90 LBS. PER SQ. YD.	E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R3	SHOULDER BERM GUTTER
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E2	PROP. APPROX. 9½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 541.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	T	EARTH MATERIAL.
C2	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E3	PROP. APPROX. 13" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 494 LBS. PER SQ. YD. IN EACH OF THREE LAYERS.	U	EXISTING PAVEMENT.
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E4	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	V1	MILLING ASPHALT PAVEMENT, 1½" DEPTH.
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	J1	8" AGGREGATE BASE COURSE.	V2	MILLING ASPHALT PAVEMENT, 2¼" DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R1	SINGLE SLOPE CONCRETE BARRIER.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	R2	SINGLE FACED CONCRETE BARRIER.	Y	PROPOSED MILLED RUMBLE STRIPS

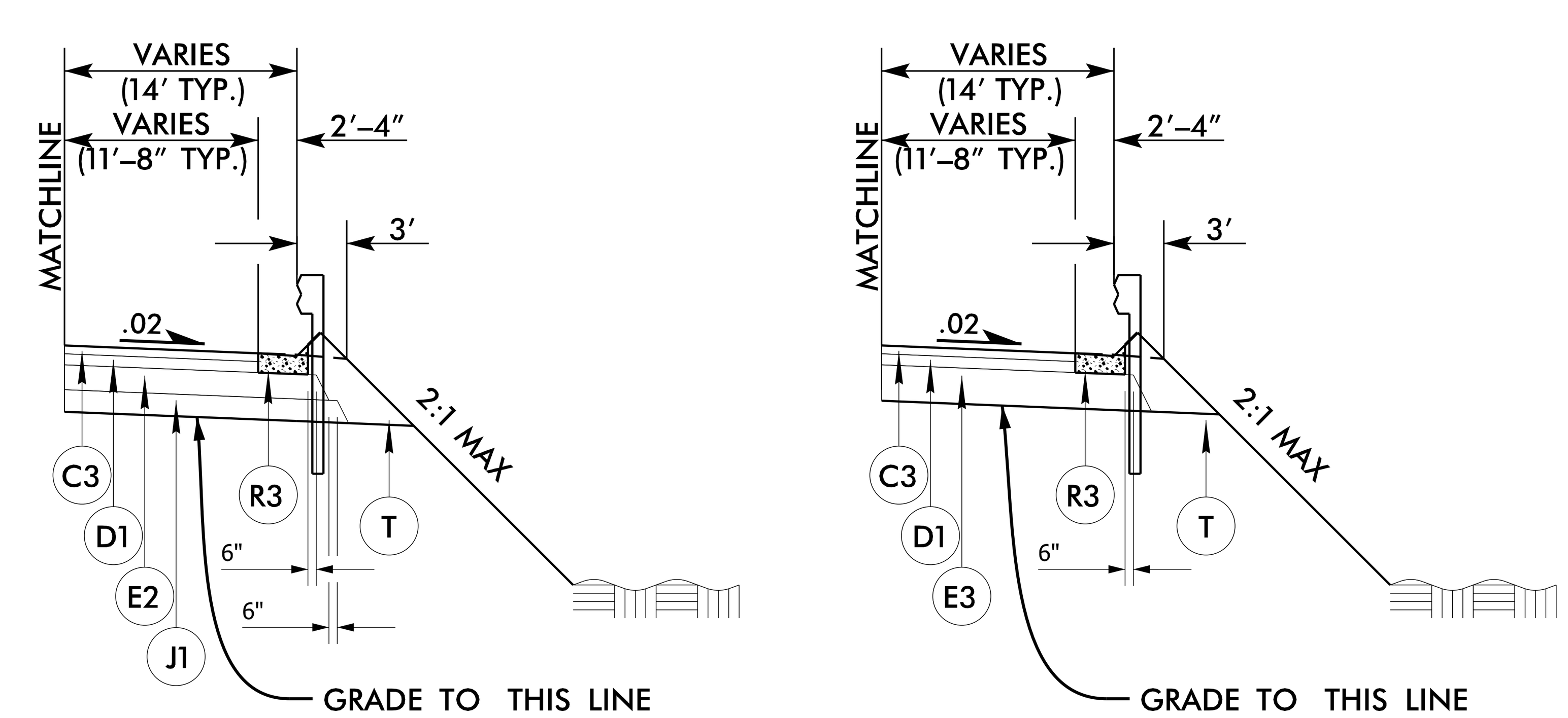
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



WEDGING DETAILS

USE WITH TYPICAL SECTIONS NO. 2, 3, & 4

NOTE: MILLING IS V2 IN LOCATIONS WITH EXISTING OGAFC



WITH ABC

WITHOUT ABC

SHOULDER BERM GUTTER DETAIL

USE WITH TYPICAL SECTIONS NO. 1, 2, 3, & 4

-L- STA. 175+38.00 TO STA. 178+63.00 LT (MIRROR DETAIL)
-L- STA. 183+96.00 TO STA. 194+91.00 RT
-L- STA. 202+75.00 TO STA. 204+50.00 LT (MIRROR DETAIL)
-L- STA. 203+75.00 TO STA. 204+50.00 RT

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	2A-2

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35016 JONATHAN C. HEFNER — 6/14/2024 — Jonathan C. Hefner
PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024964 JOSEPH T. HOLLAND — 6/14/2024 — Joseph T. Holland
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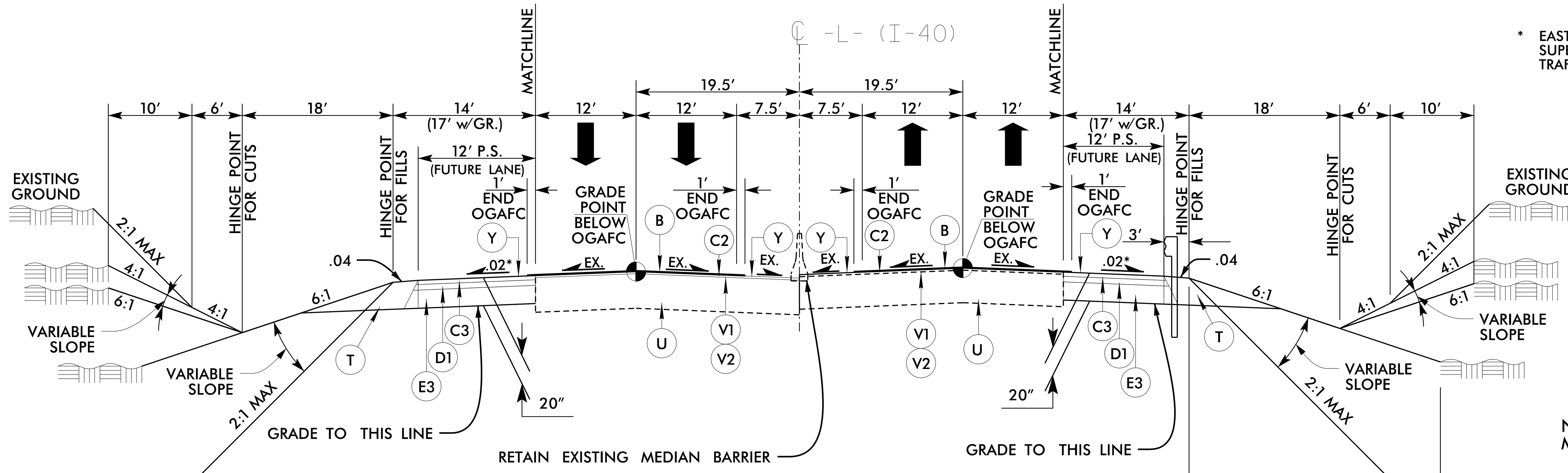
* EASTBOUND OUTSIDE PAVED SHOULDERS ARE TO MATCH SUPERELEVATION OF ADJACENT TRAVEL LANE TO FACILITATE TRAFFIC PHASING AND MEDIAN CROSSOVERS.

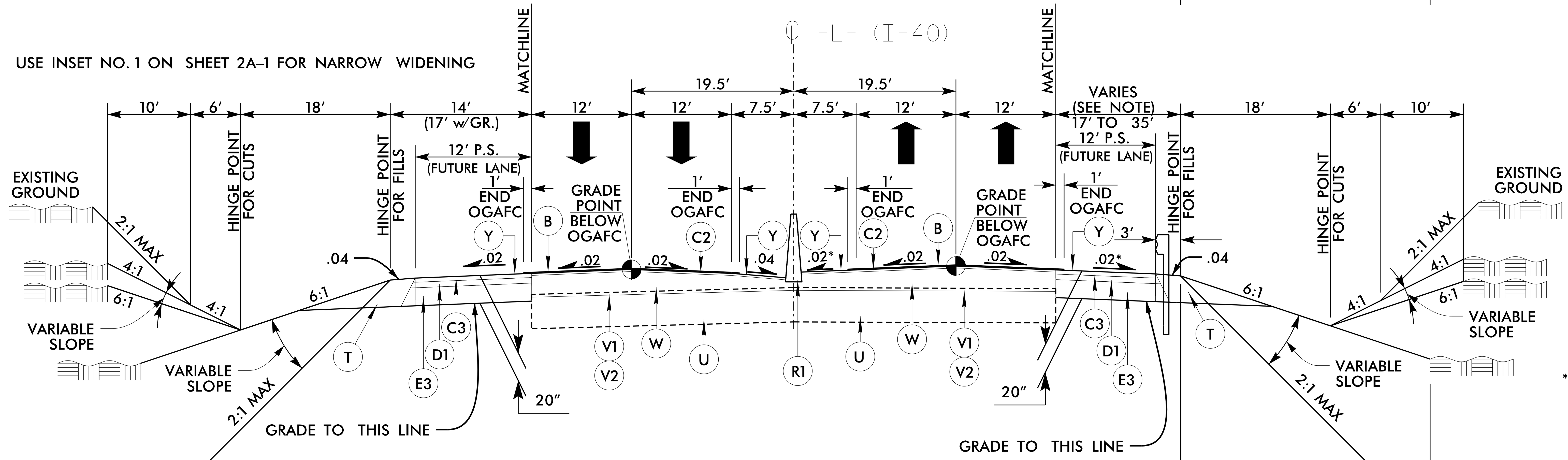


TYPICAL SECTION NO. 1

–L– STA. 171+40.00 TO STA. 175+00.00
–L– STA. 204+50.00 TO STA. 208+00.00

NOTE:
MILLING IS V2 IN LOCATIONS WITH EXISTING OGAFC

USE INSET NO. 1 ON SHEET 2A-1 FOR NARROW WIDENING



* EASTBOUND INSIDE AND OUTSIDE PAVED SHOULDERS ARE TO MATCH SUPERELEVATION OF ADJACENT TRAVEL LANE TO FACILITATE TRAFFIC PHASING AND MEDIAN CROSSOVERS.

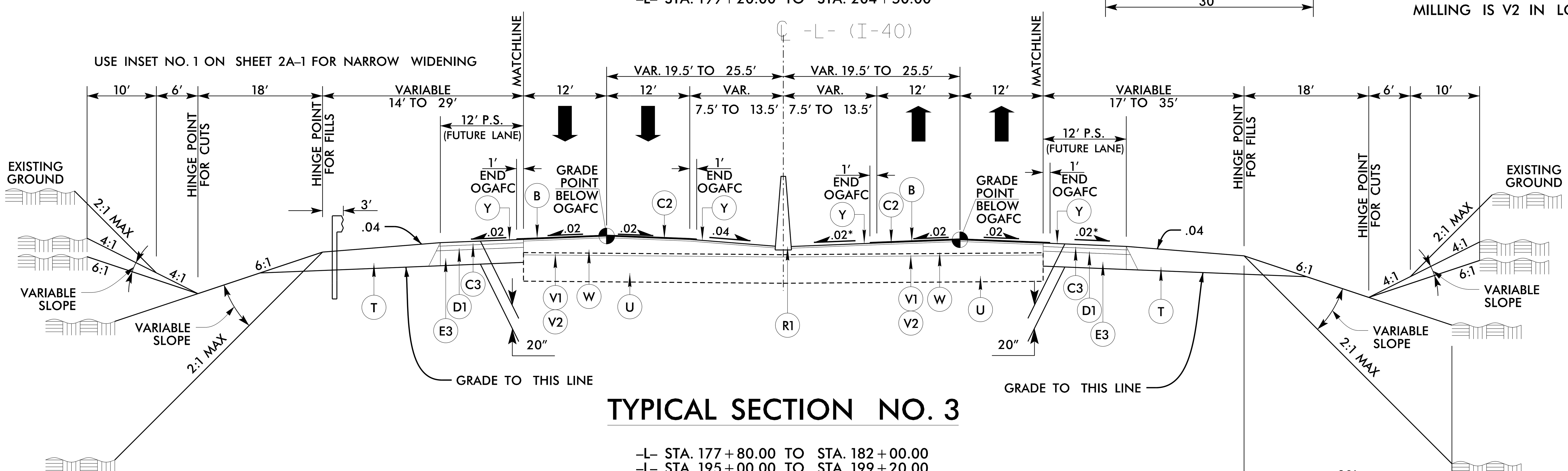
TYPICAL SECTION NO. 2

–L– STA. 175+00.00 TO STA. 177+80.00
–L– STA. 199+20.00 TO STA. 204+50.00

NOTE:
RIGHT SHOULDER POINT IS SET AT 66.5' FROM CENTERLINE FOR –L– STA. 199+20.00 TO 201+10.99 TO MATCH SHOULDER POINT FOR FUTURE WIDENING.

MILLING IS V2 IN LOCATIONS WITH EXISTING OGAFC

USE INSET NO. 1 ON SHEET 2A-1 FOR NARROW WIDENING



* EASTBOUND INSIDE AND OUTSIDE PAVED SHOULDERS ARE TO MATCH SUPERELEVATION OF ADJACENT TRAVEL LANE TO FACILITATE TRAFFIC PHASING AND MEDIAN CROSSOVERS.

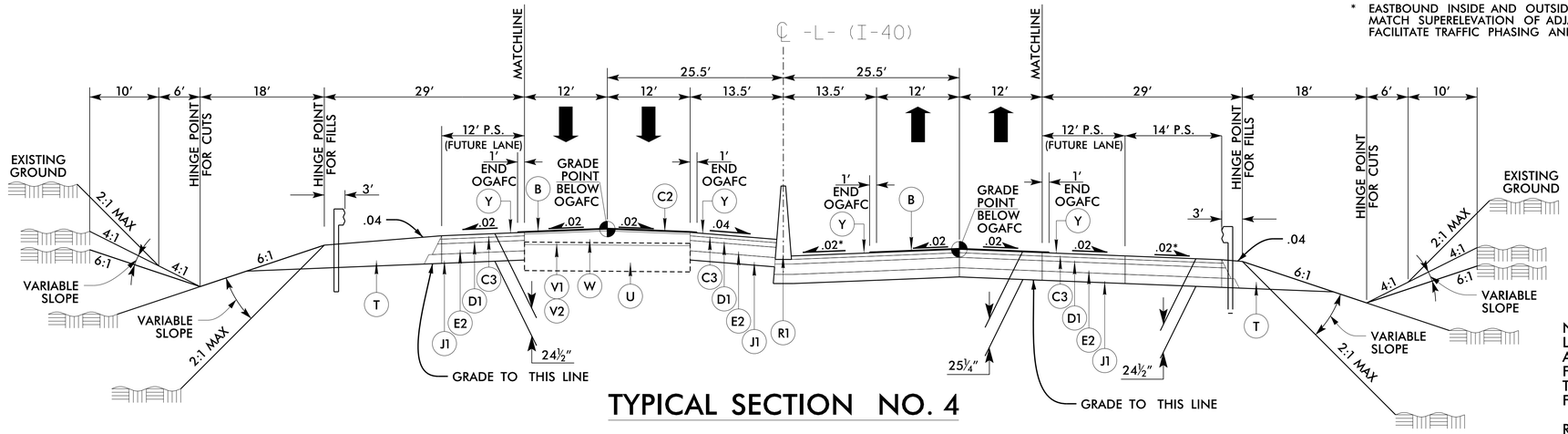
TYPICAL SECTION NO. 3

–L– STA. 177+80.00 TO STA. 182+00.00
–L– STA. 195+00.00 TO STA. 199+20.00

NOTE:
MILLING IS V2 IN LOCATIONS WITH EXISTING OGAFC

PAVEMENT SCHEDULE	
B	¾" OGAFC TYPE FC-1 MOD.
C1	3" S9.5C
C2	1½" S9.5D
C3	3" S9.5D
C4	VAR. S9.5D
D1	4" I19.0C
D2	VAR. I19.0C
E1	4" B25.0C
E2	9½" B25.0C
E3	13" B25.0C
E4	VAR. B25.0C
J1	8" ABC
R1	SINGLE SLOPE CONCRETE BARRIER
R2	SINGLE FACED CONCRETE BARRIER
R3	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	1½" MILLING
V2	2¼" MILLING
W	WEDGING
Y	RUMBLE STRIP

6/2/99



TYPICAL SECTION NO. 4

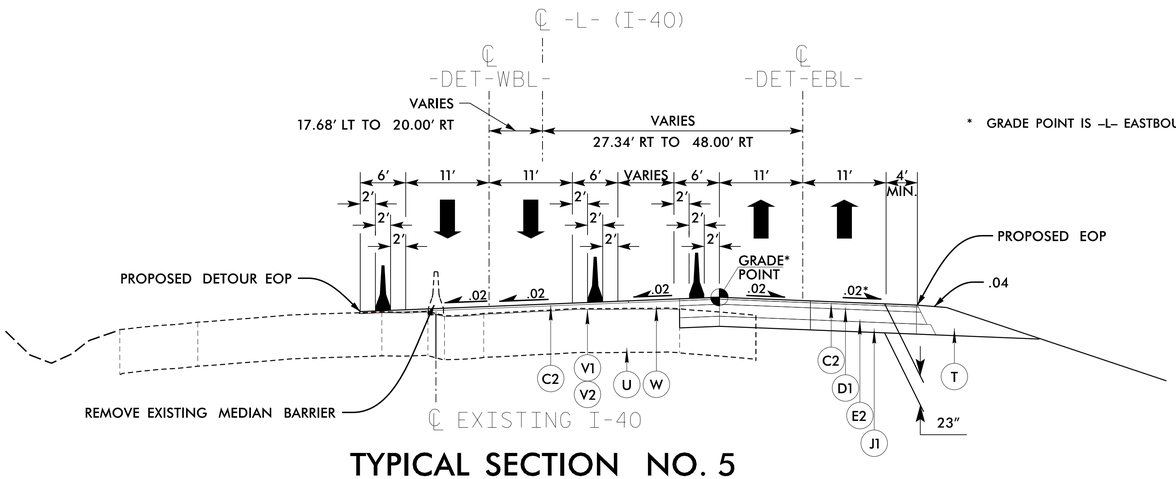
–L– STA. 182+00.00 TO STA. 195+00.00

* EASTBOUND INSIDE AND OUTSIDE PAVED SHOULDERS ARE TO MATCH SUPERELEVATION OF ADJACENT TRAVEL LANE TO FACILITATE TRAFFIC PHASING AND MEDIAN CROSSOVERS.

NOTE:
LEFT SHOULDER POINT IS SET AT 66.5′ FROM CENTERLINE FOR –L– STA. 182+00.00 TO 194+00.00 TO MATCH SHOULDER POINT FOR FUTURE WIDENING.

RIGHT SHOULDER POINT IS SET AT 66.5′ FROM CENTERLINE FOR –L– STA. 182+12.00 TO 195+00.00 TO MATCH SHOULDER POINT FOR FUTURE WIDENING.

MILLING IS V2 IN LOCATIONS WITH EXISTING OGAFC



* GRADE POINT IS –L– EASTBOUND PGL MINUS 1½″

TYPICAL SECTION NO. 5

–DET–WBL– STA. 176+49.59 TO STA. 200+00.30
–DET–EBL– STA. 176+52.80 TO STA. 199+99.73

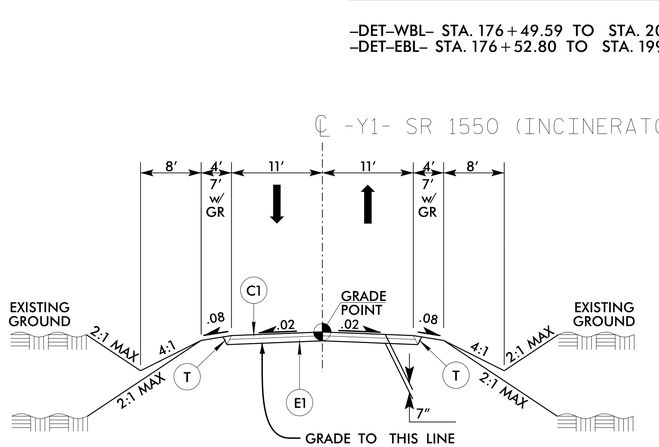
NOTES:

–DET–EBL– WILL BE CONSTRUCTED TO PROPOSED FINISHED GRADE MINUS THE FINAL LIFT OF S9.5D

–DET–WBL– WILL BE CONSTRUCTED TO PROPOSED FINISHED GRADE MINUS THE FINAL LIFT OF S9.5D AND BY EXTENSION OF THE PROPOSED EASTBOUND INSIDE TRAVEL LANE. CROSS SLOPE OF THE EXTENDED PAVEMENT WILL MATCH THE INSIDE TRAVEL LANE CROSS SLOPE TO THE PAVING LIMITS REQUIRED FOR THE DETOUR.

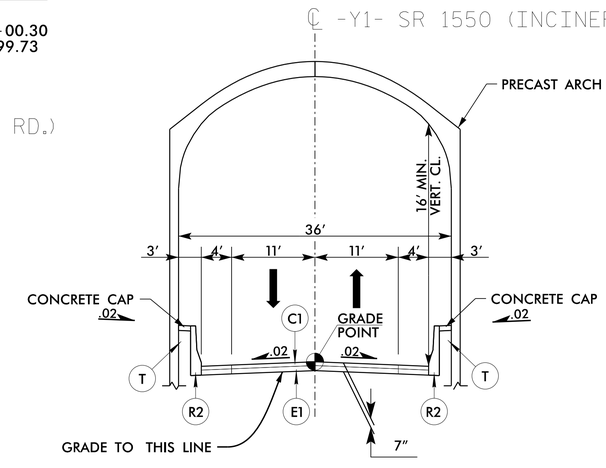
TRANSITION FROM EXISTING WESTBOUND PAVEMENT TO PROPOSED DETOUR PAVEMENT FROM –DET–WBL– STA. 175+99.69 TO 176+46.59.

TRANSITION FROM PROPOSED DETOUR PAVEMENT TO FINAL WESTBOUND PAVEMENT MINUS FINAL LIFT OF S9.5D FROM –DET–WBL– STA. 200+00.30 TO 200+50.45.



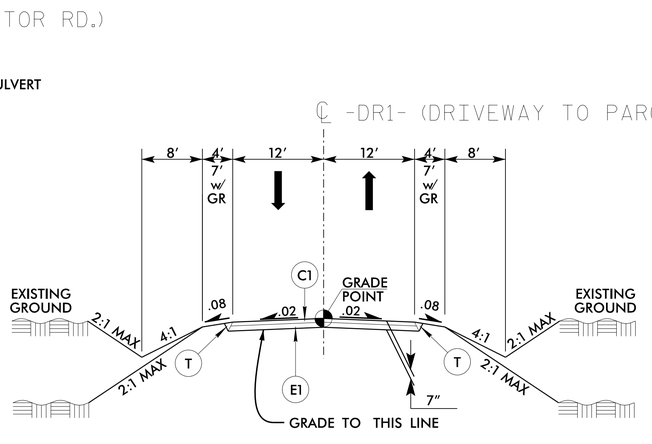
TYPICAL SECTION NO. 6

–Y1– STA. 10+00.00 TO STA. 12+68.00
–Y1– STA. 14+42.00 TO STA. 20+00.00



TYPICAL SECTION NO. 7

–Y1– STA. 12+68.00 TO STA. 14+42.00



TYPICAL SECTION NO. 8

–DR1– STA. 10+11.04 TO STA. 11+50.00

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	2A-3

ROADWAY DESIGN ENGINEER
5/14/2024
NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER JONATHAN C. HEFNER
DocuSigned by: Jonathan C. Hefner

PAVEMENT DESIGN ENGINEER
5/14/2024
NORTH CAROLINA PROFESSIONAL SEAL 024964 ENGINEER JOSEPH T. HOLLAND
DocuSigned by: Joseph T. Holland
02BB9ADB7E0E478...

ETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE

B	¾″ OGAFC TYPE FC-1 MOD.
C1	3″ S9.5C
C2	1½″ S9.5D
C3	3″ S9.5D
C4	VAR. S9.5D
D1	4″ I19.0C
D2	VAR. I19.0C
E1	4″ B25.0C
E2	9½″ B25.0C
E3	13″ B25.0C
E4	VAR. B25.0C
J1	8″ ABC
R1	SINGLE SLOPE CONCRETE BARRIER
R2	SINGLE FACED CONCRETE BARRIER
R3	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	1½″ MILLING
V2	2¼″ MILLING
W	WEDGING
Y	RUMBLE STRIP

5/13/2024
HB0003_rdy_psh_02A-03_typ.dgn
USER: jhefner

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	2B-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — 5/14/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35016 JONATHAN C. HEFNER — Jonathan C. Hefner

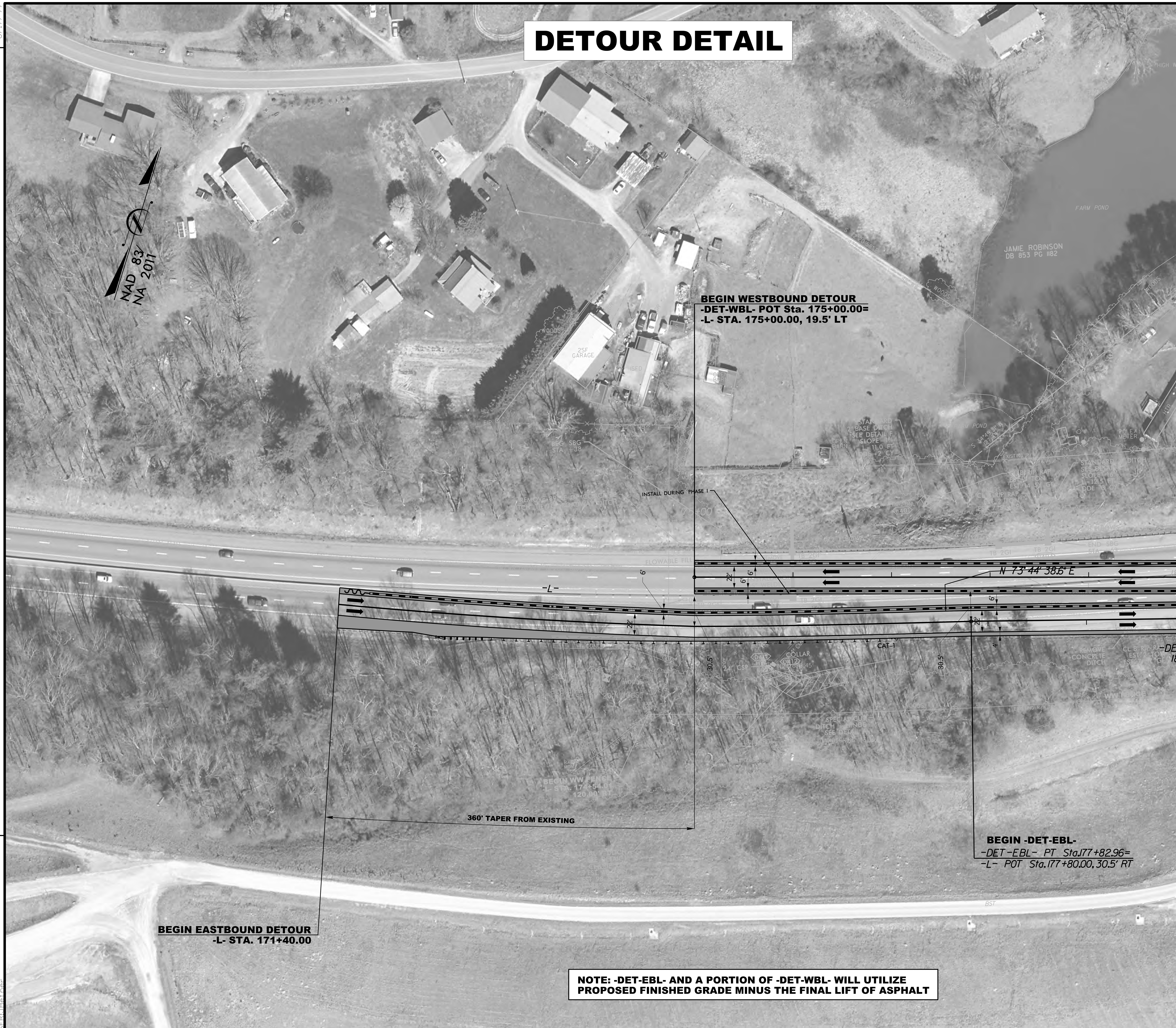
HYDRAULICS ENGINEER — 5/14/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 053425 MATTHEW L. HARVEY — Matthew L. Harvey

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

DETOUR DETAIL



MATCHLINE -DET-WBL- STA. 180+00
SEE SHEET 2B-2

8/17/99

5/13/2024
HB0003_rdy_psh_02B-01_Detail-Detours.dgn

DETOUR DETAIL

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	2B-2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
5/14/2024
NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER JONATHAN C HEFNER
DocuSigned by: Jonathan C. Hefner
02BB9ADB7E0E478...

HYDRAULICS ENGINEER
5/14/2024
NORTH CAROLINA PROFESSIONAL SEAL 053425 ENGINEER MATTHEW LEE HARNEY
DocuSigned by: Matthew L. Harney
DocuSigned by:

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-DET-WBL- CURVE DATA
PI Sta 187+50.92
Δ = 3°16'43.1" (LT)
D = 0°40'43.9"
L = 482.96'
T = 241.55'
R = 8,440.00'
SE = RC
DS = 60 MPH

NAD 83 NA 2011

-DET-WBL- PC Sta185+09.37

-DET-WBL- PT Sta189+92.34

-DET-EBL- PC Sta183+97.01

-DET-EBL- PT Sta189+09.22

MATCHLINE -DET-WBL- STA. 180+00, SEE SHEET 2B-1

MATCHLINE -DET-WBL- STA. 194+00, SEE SHEET 2B-3

-DET-EBL- CURVE DATA
PI Sta 186+53.16
Δ = 2°33'07.0" (LT)
D = 0°29'53.6"
L = 512.21'
T = 256.15'
R = 11,500.00'
SE = NC
DS = 60 MPH

NOTE: -DET-EBL- AND A PORTION OF -DET-WBL- WILL UTILIZE PROPOSED FINISHED GRADE MINUS THE FINAL LIFT OF ASPHALT

REVISIONS 8/17/99

5/13/2024
5:\Projects\HB-0003_rdu_psh_02B-02_Detail-Detours.dgn
USER:mlhefner

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	2B-3
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — 5/14/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35016 JONATHAN C. HEFNER — DocuSigned by: Jonathan C. Hefner 02BB9ADB7E0E478...

HYDRAULICS ENGINEER — 5/14/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 053425 MATTHEW L. HARVEY — DocuSigned by: Matthew L. Harvey DB419C2087B94EE...

WETHERILL ENGINEERING
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Raleigh, N.C. 27606
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TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETOUR DETAIL

REVISIONS

MATCHLINE -DET-WBL- STA. 194+00, SEE SHEET 2B-2

-DET-WBL- CURVE DATA

PI Sta	199+58.90
Δ =	9° 43' 04.2" (RT)
D =	1° 25' 17.6"
L =	683.61'
T =	342.62'
R =	4,030.50'
SE =	.04
DS =	60 MPH

-DET-EBL- CURVE DATA

PI Sta	198+50.99
Δ =	9° 43' 04.2" (RT)
D =	1° 25' 56.6"
L =	678.43'
T =	340.03'
R =	4,000.00'
SE =	.04
DS =	60 MPH

NOTE: -DET-EBL- AND A PORTION OF -DET-WBL- WILL UTILIZE PROPOSED FINISHED GRADE MINUS THE FINAL LIFT OF ASPHALT

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	2B-4

ROADWAY DESIGN ENGINEER — Jonathan C. Hefner — NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER — 5/14/2024

HYDRAULICS ENGINEER — Matthew L. Harvey — NORTH CAROLINA PROFESSIONAL SEAL 053425 ENGINEER — 5/14/2024

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
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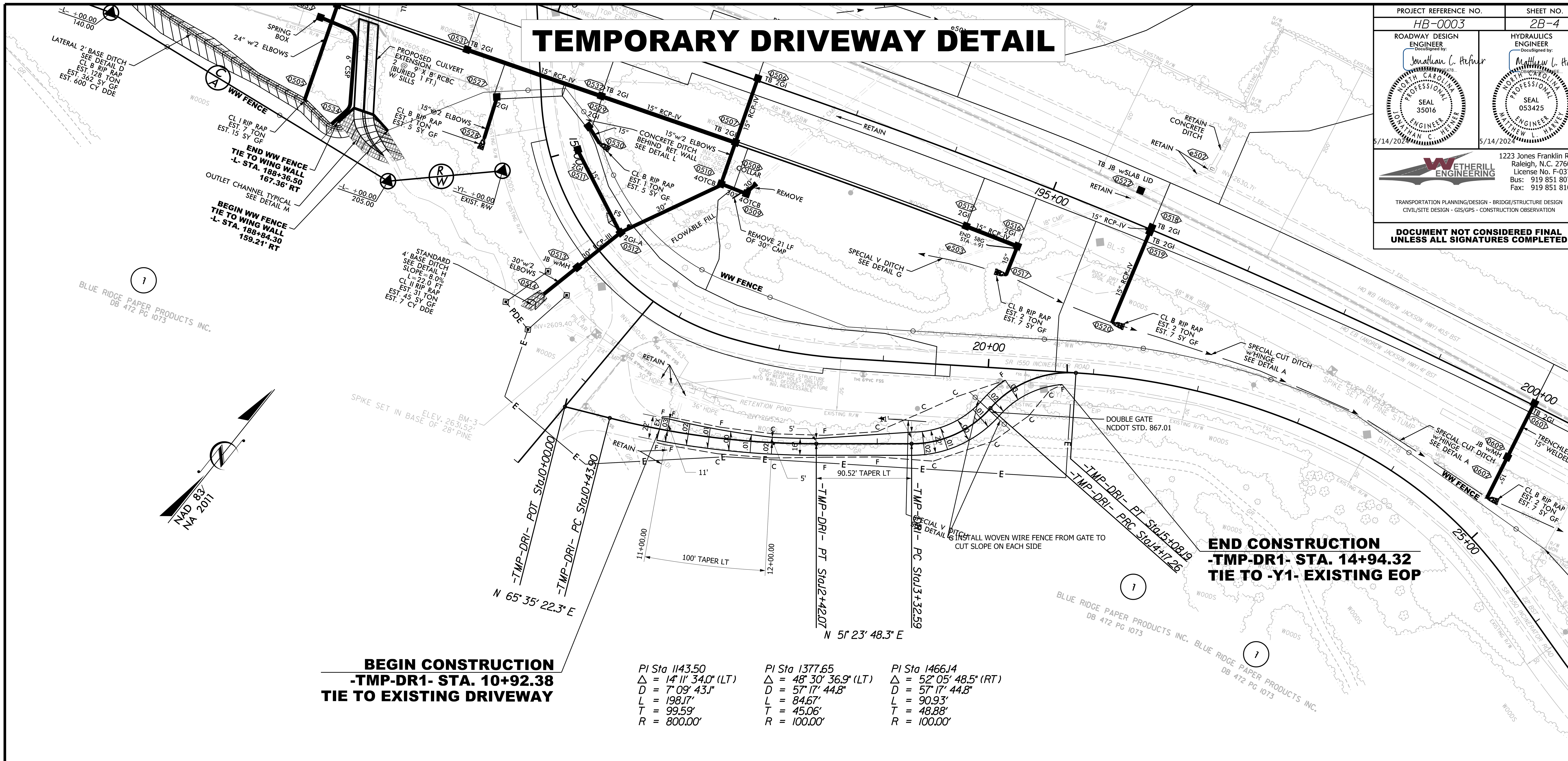
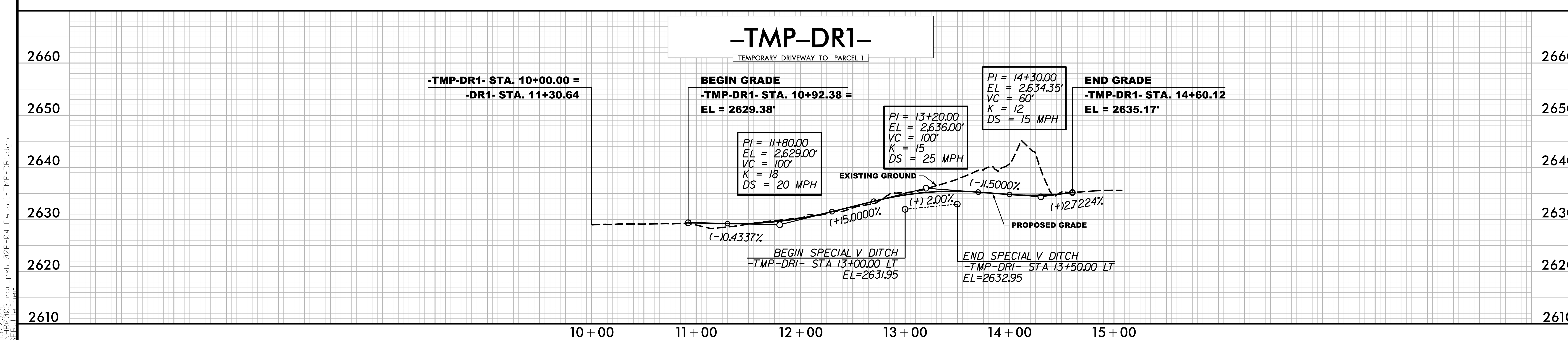
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

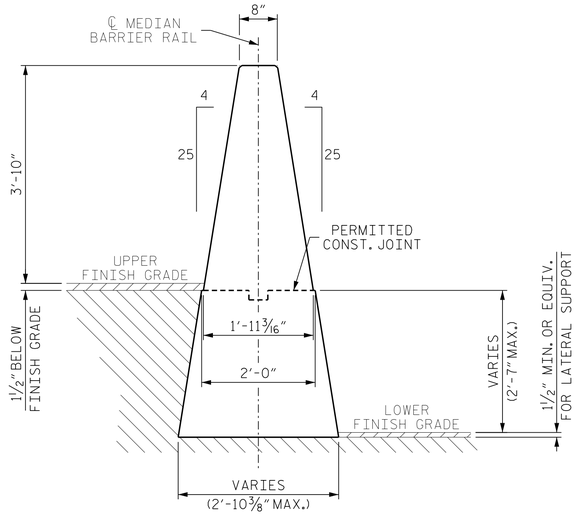
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TEMPORARY DRIVEWAY DETAIL

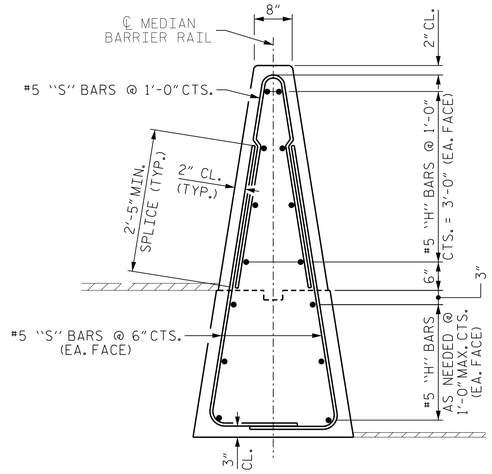

BEGIN CONSTRUCTION
-TMP-DR1- STA. 10+92.38
TIE TO EXISTING DRIVEWAY
END CONSTRUCTION
-TMP-DR1- STA. 14+94.32
TIE TO -Y1- EXISTING EOP
-TMP-DR1- POT Sta.10+00.00
-TMP-DR1- PC Sta.10+43.90
-TMP-DR1- PT Sta.12+42.07
-TMP-DR1- PC Sta.13+32.59
-TMP-DR1- PT Sta.15+08.19
-TMP-DR1- PRC Sta.14+17.26
N 65° 35' 22.3" E
N 51° 23' 48.3" E
PI Sta 11+43.50
Δ = 14° 11' 34.0" (LT)
D = 7° 09' 43.1"
L = 198.17'
T = 99.59'
R = 800.00'
PI Sta 13+77.65
Δ = 48° 30' 36.9" (LT)
D = 57° 17' 44.8"
L = 84.67'
T = 45.06'
R = 100.00'
PI Sta 14+66.14
Δ = 52° 05' 48.5" (RT)
D = 57° 17' 44.8"
L = 90.93'
T = 48.88'
R = 100.00'
DOUBLE GATE
NCDOT STD. 867.01
INSTALL WOVEN WIRE FENCE FROM GATE TO CUT SLOPE ON EACH SIDE
100' TAPER LT
90.52' TAPER LT
BLUE RIDGE PAPER PRODUCTS INC.
DB 472 PG 1073
NAD 83/NA 2011
WW FENCE
195+00
200+00
20+00
25+00


-TMP-DR1-
TEMPORARY DRIVEWAY TO PARCEL 1
-TMP-DR1- STA. 10+00.00 =
-DR1- STA. 11+30.64
BEGIN GRADE
-TMP-DR1- STA. 10+92.38 =
EL = 2629.38'
END GRADE
-TMP-DR1- STA. 14+60.12
EL = 2635.17'
PI = 11+80.00
EL = 2,629.00'
VC = 100'
K = 18
DS = 20 MPH
PI = 13+20.00
EL = 2,636.00'
VC = 100'
K = 15
DS = 25 MPH
PI = 14+30.00
EL = 2,634.35'
VC = 60'
K = 12
DS = 15 MPH
EXISTING GROUND
PROPOSED GRADE
(-)0.4337%
(+)5.0000%
(+) 2.00%
(-)1.5000%
(+)2.7224%
BEGIN SPECIAL V DITCH
-TMP-DR1- STA 13+00.00 LT
EL=2631.95
END SPECIAL V DITCH
-TMP-DR1- STA 13+50.00 LT
EL=2632.95
2660
2650
2640
2630
2620
2610
10+00
11+00
12+00
13+00
14+00
15+00

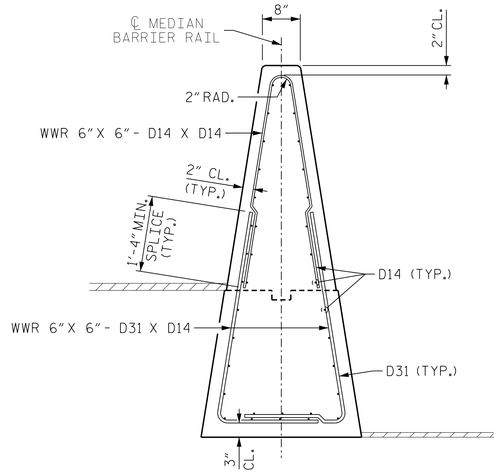
PROJECT REFERENCE NO.	SHEET NO.
HB-0003	2C-1



CONCRETE DETAILS



REINFORCEMENT DETAILS



WELDED WIRE FABRIC
OPTIONAL REINFORCING

SINGLE SLOPE CONCRETE BARRIER (2'-7" MAX. BIFURCATION)

SECTION SHOWN IS WITH RESPECT TO MAXIMUM 2'-7" BIFURCATION

GENERAL NOTES:

ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2024 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N.C. DEPARTMENT OF TRANSPORTATION

USE CLASS "AA" CONCRETE.

ALL EXPOSED CORNERS ON BARRIER SHALL BE CHAMFERED ¾".

MAINTAIN 2" CLEAR COVER FOR ALL REINFORCING STEEL AND WELDED WIRE FABRIC UNLESS NOTED OTHERWISE.

REINFORCING STEEL (REBAR) SHALL MEET THE REQUIREMENTS OF ASTM A615, GRADE 60.

WELDED WIRE FABRIC SHALL MEET THE REQUIREMENTS OF ASTM A497, GRADE 70. ALL WIRES FOR WELDED WIRE FABRIC SHALL BE DEFORMED.

#5 "S" BAR SPLICE 2'-5"
#5 "H" BAR SPLICE 3'-2"
D14 WELDED WIRE FABRIC SPLICE 1'-4"

ANY METHOD DEVISED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER THAT SHALL ASSURE THAT THE LONGITUDINAL ROADWAY STEEL WILL BE POSITIONED 1/2" ± AS DIMENSIONED ON THE PLANS WILL BE DEEMED SATISFACTORY.

REFER TO ROADWAY STANDARD DRAWING NO. 854.01 FOR EXPANSION AND CONTRACTION JOINT FILLER AND OTHER SPECIFICATIONS

6/3/2024

NORTH CAROLINA PROFESSIONAL SEAL 22072 ENGINEER JOHN A. DILWORTH

DocuSigned by:
John Arthur Dilworth
62138269228438...

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

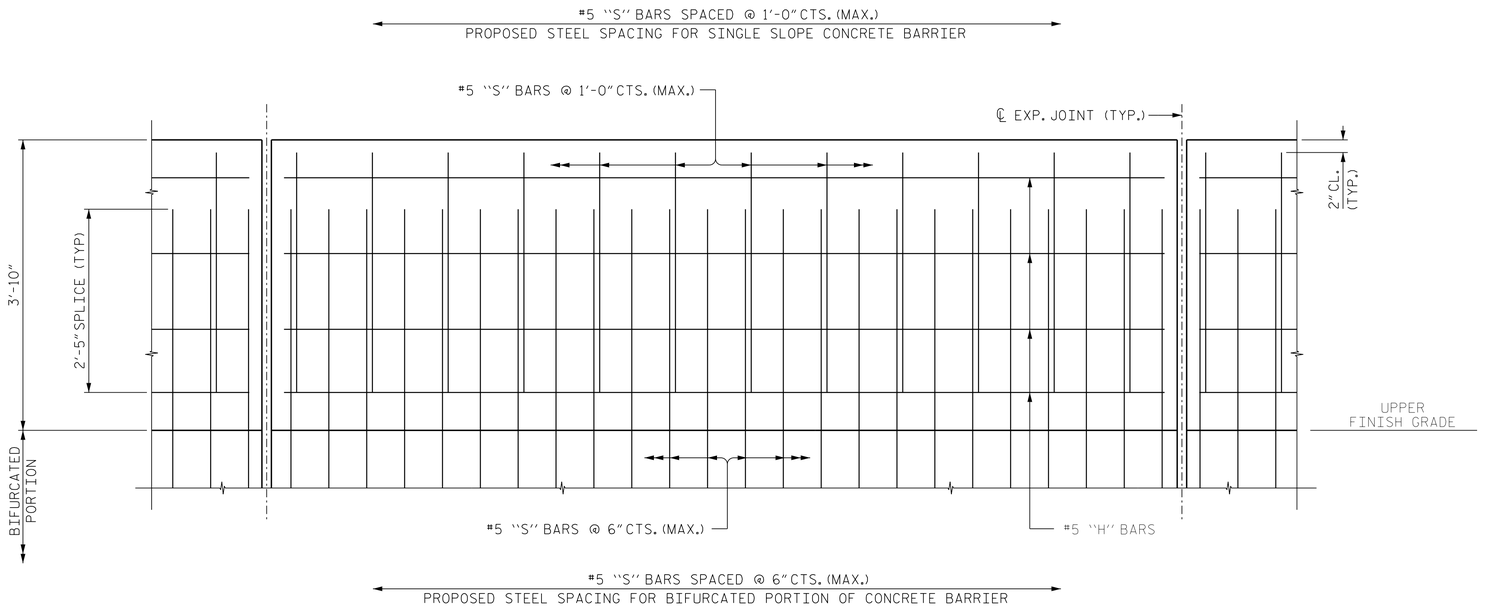
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SINGLE SLOPE CONCRETE BARRIER (46" MIN. HEIGHT) SHEET 1 OF 2

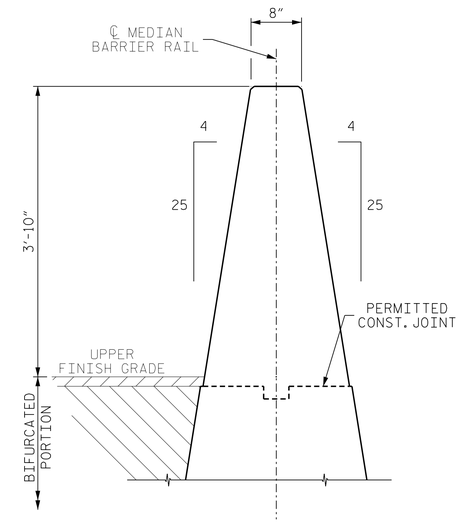
ORIGINAL BY:_____ DATE:_____
MODIFIED BY:_____ DATE:_____
CHECKED BY:_____ DATE:_____
FILE SPEC.:_____

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	2C-2

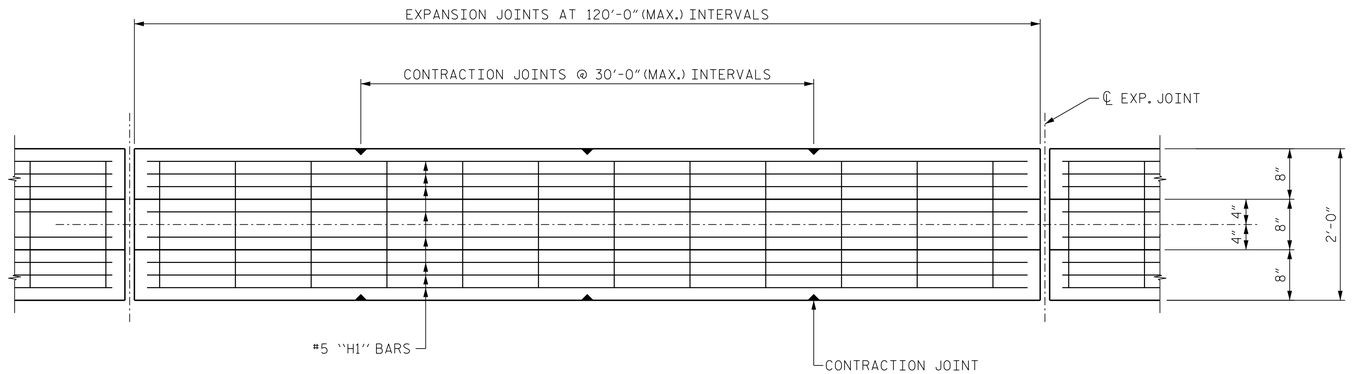


ELEVATION

3'-10" MEDIAN BARRIER REINFORCEMENT SHOWN
FOR REINFORCEMENT IN BIFURCATED SECTION, SEE "SINGLE SLOPE CONCRETE BARRIER DETAILS" SHEET 1 OF 2



BARRIER SECTION



PLAN VIEW

5/14/2024

NORTH CAROLINA PROFESSIONAL SEAL 22072 ENGINEER JOHN A. DILWORTH

DocuSigned by:
John Arthur Dilworth
621382269228438...

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

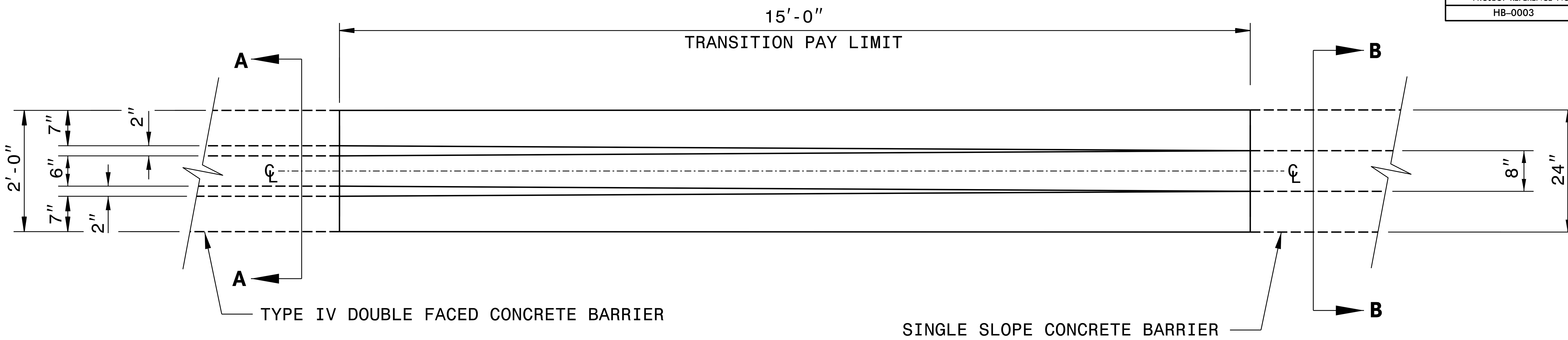
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

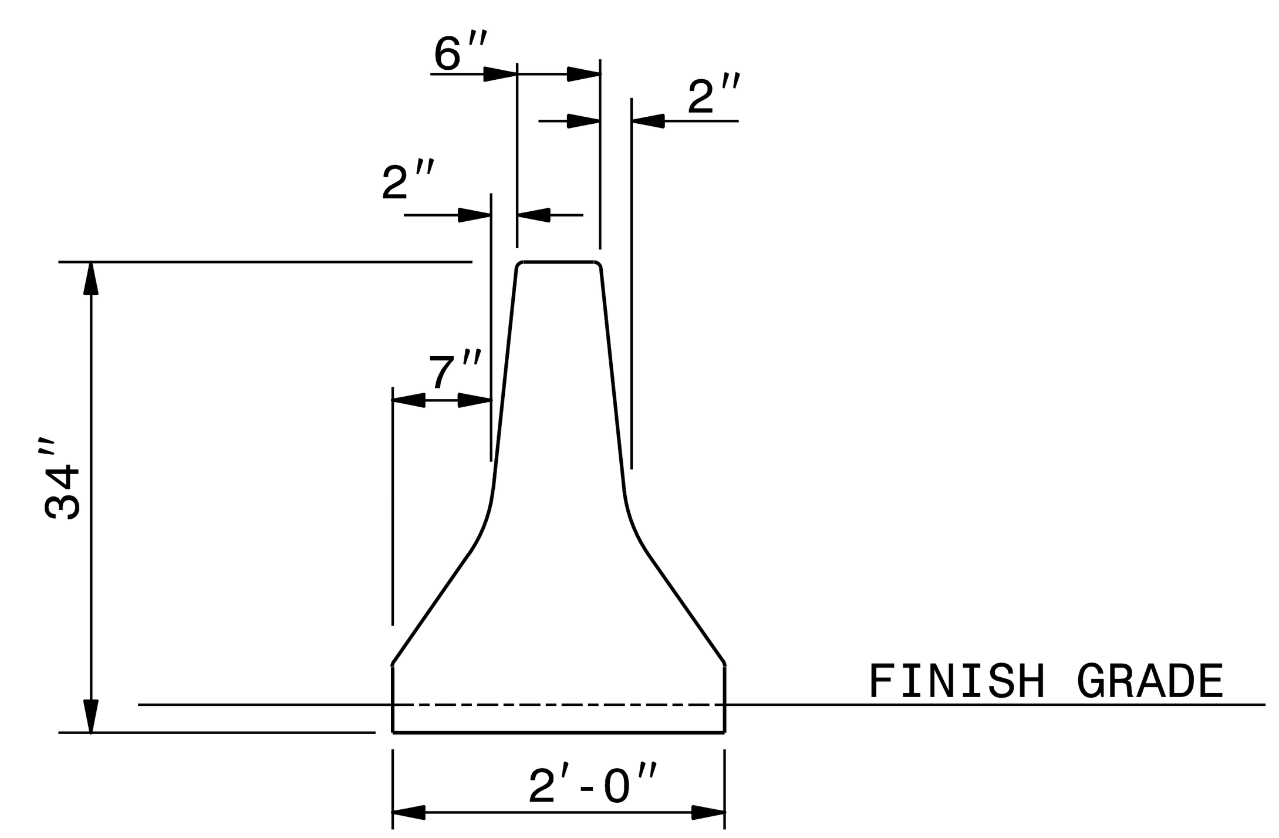
SINGLE SLOPE CONCRETE BARRIER (46" MIN. HEIGHT) SHEET 2 OF 2

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	2C-3

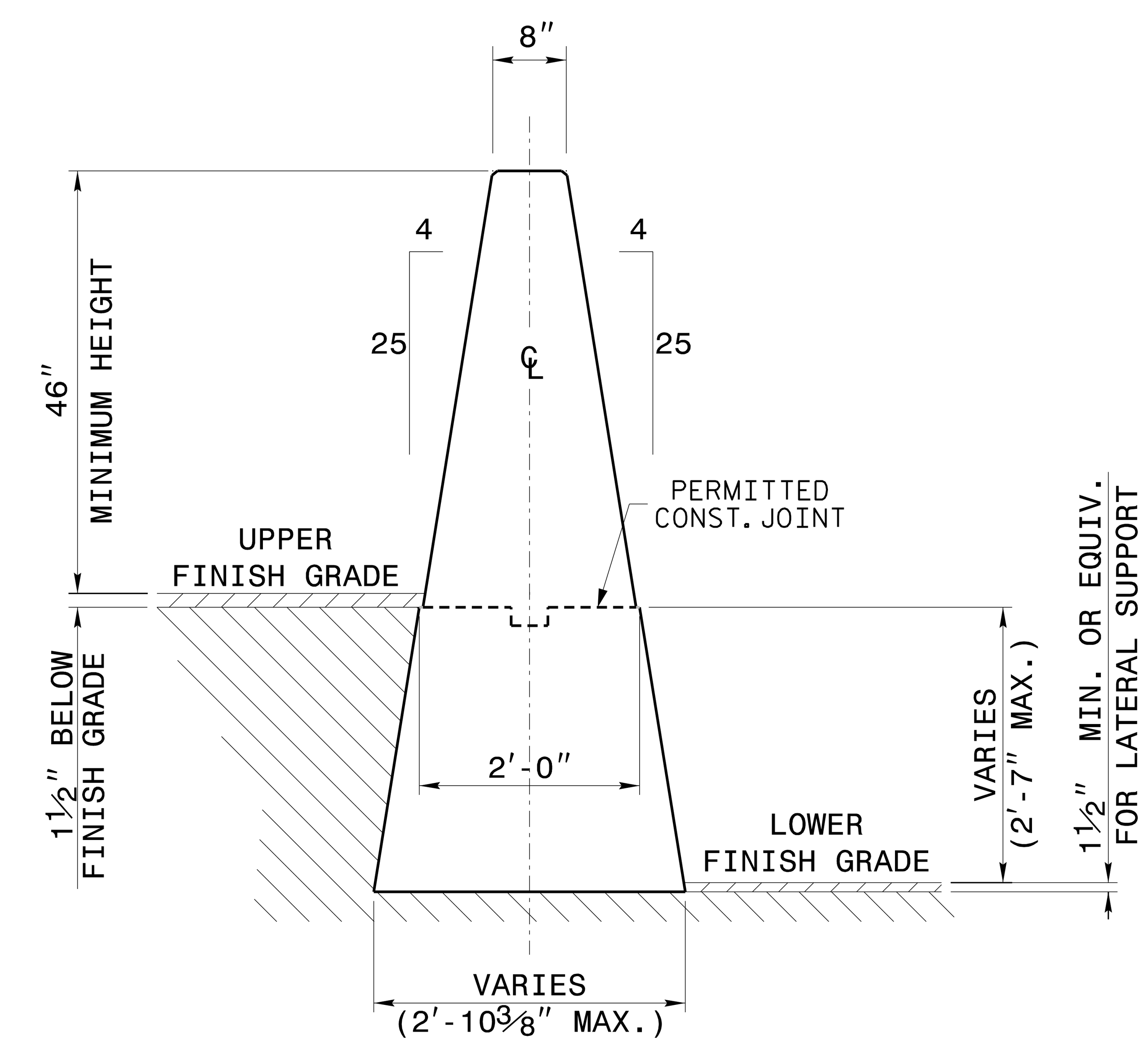


TRANSITION FROM TYPE IV DOUBLE FACED CONCRETE BARRIER TO SINGLE SLOPE CONCRETE BARRIER



SECTION A-A

TYPE IV DOUBLE FACED CONCRETE BARRIER



SECTION B-B

SINGLE SLOPE CONCRETE BARIIER

NOTES:
SEE SPECIAL DETAILS PERTAINING TO SINGLE SLOPE BARRIERS FOR CONSTRUCTION METHODS AND STEEL PLACEMENT.

SEE ROADWAY DETAILS AND ROADWAY STANDARD DRAWINGS FOR TYPE IV DOUBLE FACED CONCRETE BARRIER CONSTRUCTION METHODS AND STEEL PLACEMENT.

DIMENSIONS OF TYPE IV DOUBLE FACED CONCRETE BARRIER ARE APPROXIMATE AND SHOULD BE FIELD VERIFIED.

5/14/2024
NORTH CAROLINA PROFESSIONAL SEAL 22072 ENGINEER JOHN A. DILWORTH
DocuSigned by: John Arthur Dilworth

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

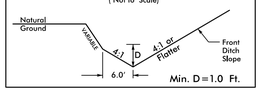
SINGLE SLOPE CONCRETE BARRIER TRANSITION

ORIGINAL BY: ______ DATE: ______
MODIFIED BY: ______ DATE: ______
CHECKED BY: ______ DATE: ______
FILE SPEC.: ______

8/17/99

REVISIONS

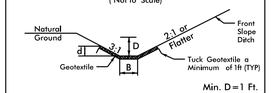
DETAIL A
SPECIAL CUT DITCH wHINGE
(Not to Scale)



Min. D=1.0 Ft.

FROM –L– STA. 176+50 TO STA. 177+00 RT
FROM –L– STA. 192+50 TO STA. 193+45 LT
FROM –L– STA. 196+00 TO STA. 203+00 RT

DETAIL B
SPECIAL BASE DITCH
(Not to Scale)

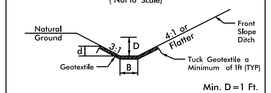


Min. D=1 Ft.
d=1 Ft.
B=3 Ft.

Type of Liner=Class I Rip–Rap, Keyed–In

FROM –L– STA. 202+50 TO STA. 203+50 LT

DETAIL C
SPECIAL BASE DITCH
(Not to Scale)

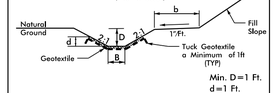


Min. D=1 Ft.
d=1 Ft.
B=4 Ft.

Type of Liner=Class I Rip–Rap, Keyed–In

FROM –L– STA. 175+50 TO STA. 176+00 LT

DETAIL D
LATERAL BASE DITCH
(Not to Scale)



Min. D=1 Ft.
d=1 Ft.
B=2 Ft.
b=5 Ft.

Type of Liner=Class B Rip–Rap, Keyed–In

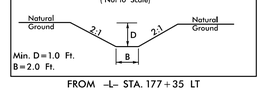
FROM –L– STA. 185+50 TO STA. 188+35 RT

DETAIL E
STANDARD 'V' DITCH
(Not to Scale)

Min. D=1.0 Ft.

FROM –L– STA. 178+60 LT

DETAIL F
STANDARD BASE DITCH
(Not to Scale)



Min. D=1.0 Ft.
B=2.0 Ft.

FROM –L– STA. 177+35 LT

DETAIL G
SPECIAL 'V' DITCH
(Not to Scale)

Min. D=1.0 Ft.

FROM –Y1– STA. 11+65 TO STA. 12+65 RT
FROM –Y1– STA. 10+76.50 TO STA. 12+65 LT
FROM –L– STA. 184+50 TO STA. 185+50 RT
FROM –L– STA. 194+00 TO STA. 194+88 RT
FROM –TMP–DR1– STA. 13+00 TO STA. 13+50 RT

DETAIL H
STANDARD BASE DITCH
(Not to Scale)

Min. D=1.0 Ft.
d=1.0 Ft.
B=4.0 Ft.

Type of Liner=Class II Rip–Rap, Keyed–In

FROM –Y1– STA. 16+00 RT

DETAIL I
LATERAL 'V' DITCH
(Not to Scale)

Min. D=1 Ft.
d= 1 Ft.
B=3.0 Ft.

Type of Liner= Class I Rip–Rap, Keyed–In b= 5 Ft.

FROM –L– STA. 175+76 TO STA. 176+50 RT

DETAIL J
SPECIAL BASE DITCH
(Not to Scale)

Min. D=1 Ft.
d=1.0 Ft.
B=3.0 Ft.

Type of Liner=Class B Rip–Rap, Keyed–In

FROM –L– STA. 203+00 TO STA. 203+40 RT

DETAIL K
FALSE SUMP
(Not to Scale)

–L– STA. 182+45 RT
–L– STA. 184+20 RT
–Y1– STA. 15+80 LT

DETAIL L
CONCRETE DITCH
BEHIND RETAINING WALL
(Not to Scale)

FROM –L– STA. 188+65 TO STA. 190+14 LT
FROM –L– STA. 189+68 TO STA. 190+66 RT

DETAIL M
OUTLET TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
NOT TO SCALE

EST TON CLASS 'I' RIP RAP = 80 TONS
EST GEOTEXTILE = 115 SY
EST COIR FIBER MAT = 40 SY

FROM –L– STA. 188+37 TO 189+08 RT

DETAIL N
SPECIAL CUT DITCH wHINGE
(Not to Scale)

Min. D=1.0 Ft.
d=1.0 Ft.

Type of Liner=Class I Rip–Rap, Keyed–In

FROM –L– STA. 183+00 TO STA. 184+00 LT

DETAIL
(NOT TO SCALE)

SKEWED MULTI–BARREL CULVERT LOW FLOW CHANNEL AND FLOOD PLAIN

*NOTES:

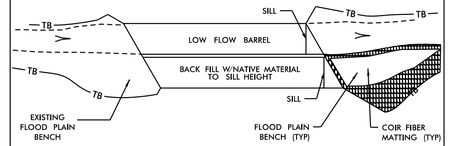
1) NATIVE MATERIAL IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP–RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL(S). IF RIP–RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL(S), NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

2) PROPOSED CULVERT EXTENSION WILL BE BURIED 1.0'

3) FLOODPLAIN BENCH TO BE INSTALLED AT THE OUTLET OF THE PROPOSED RCBC IN THE RIGHT BARREL.

4) SILLS ARE TO BE 1.0' WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

5) TOP OF LOW FLOW SILL SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM (THALWEG).



PLAN VIEW

913

FROM –L– STA. 188+23 TO 188+67 RT

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	2D-1

R/W SHEET NO.

HYDRAULICS ENGINEER
5/14/2024

NORTH CAROLINA PROFESSIONAL SEAL 053425 ENGINEER MATTHEW HARVEY

DocuSigned by:
Matthew L. Harvey
DocuSign Envelope ID: 6C678498-28DA-420E-B672-290C14E1DD88

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 031361 ENGINEER SHIPING YANG

DocuSigned by: Shiping Yang 7A7310E67F76411... 05/06/2024

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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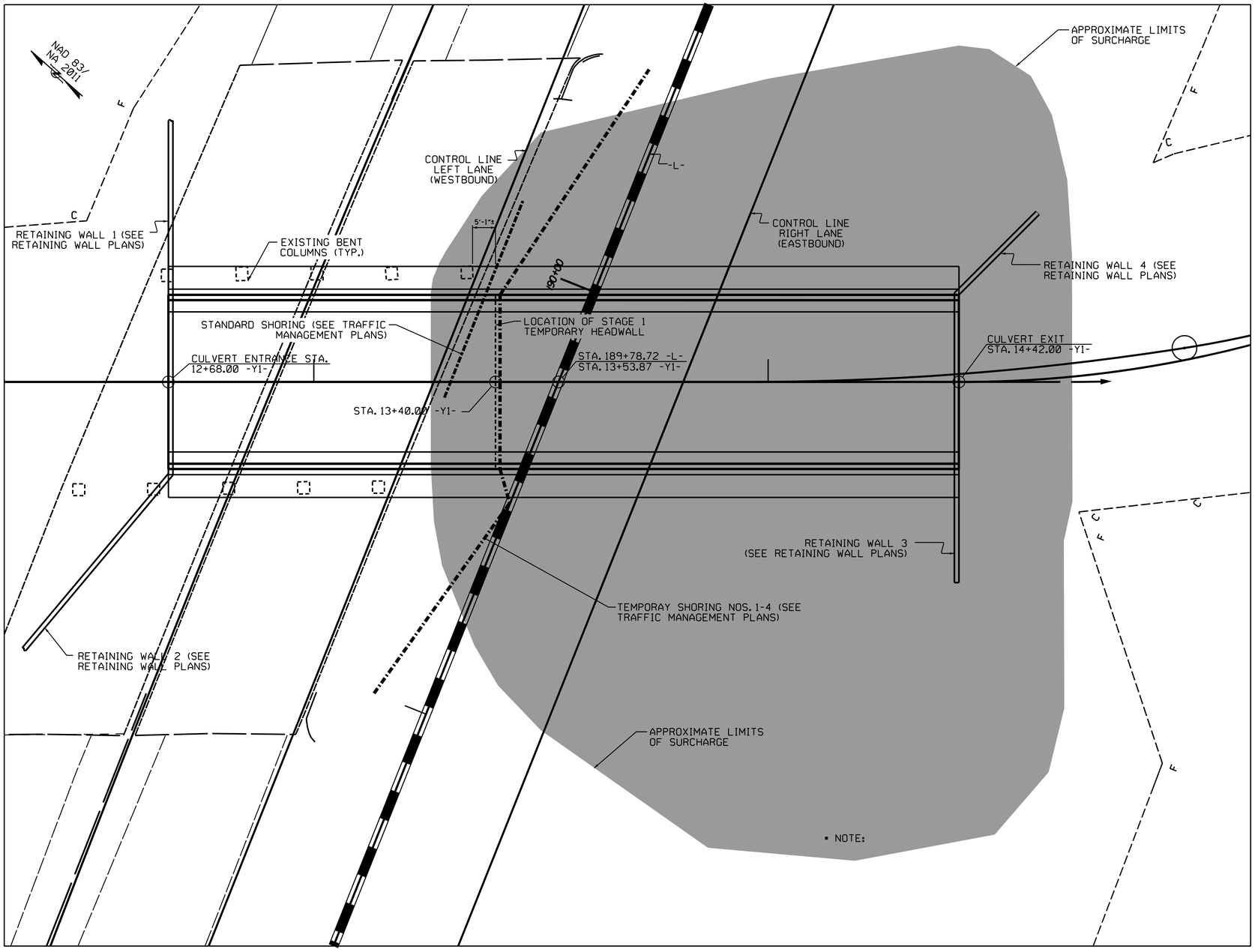

STAGE 1 PLAN VIEW

ACTUAL FOOTING AND PEDESTAL DIMENSIONS TO BE DESIGNED BY THE CONTRACTOR. ESTIMATED SIZES SHOWN ARE FOR BIDDING PURPOSES ONLY.

INDICATES ESTIMATED LIMITS ON SURCHARGE

Stage 1 Sequence:
1) Install 4 settlement gauges to monitor surcharge settlement in accordance to NCDOT Standard 235.01. Operations Engineer and contractor to determine locations at the time of construction.
2) Install settlement points at each bent of existing East bound bridge.
3) Place surcharge fill to the limits shown on plans.
4) Monitor settlement until a acceptable rate is observed, Operation Engineer will release the removal of Surcharge at this time. If excessive settlement or movement of the existing bridge is observed then remove surcharge fill beneath the existing structure. Provide settlement reading to the NCDOT Operations Engineer on a bi-weekly basis.
5) Remove surcharge and construct Stage 1 Tunnel, Retaining Wall Nos. 3 and 4, Standard Shoring and Temporary shoring no. 1-4.

STAGE 1 SURCHARGE QUANTITIES	
BORROW EXCAVATION	18,900 YD
UNCLASSIFIED EXCAVATION	18,900 YD
EMBANKMENT SETTLEMENT GAUGES	4 EA

PREPARED BY:	MHS	DATE:	12/23
REVIEWED BY:	SY/SCC	DATE:	12/23

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SURCHARGE PLAN VIEW STAGE 1

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	-	-	3	-	-
2	-	-	4	-	-

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	2G-2

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 031361 ENGINEER CHIPING YANG

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05/06/2024

SIGNATURE DATE

ENGINEER

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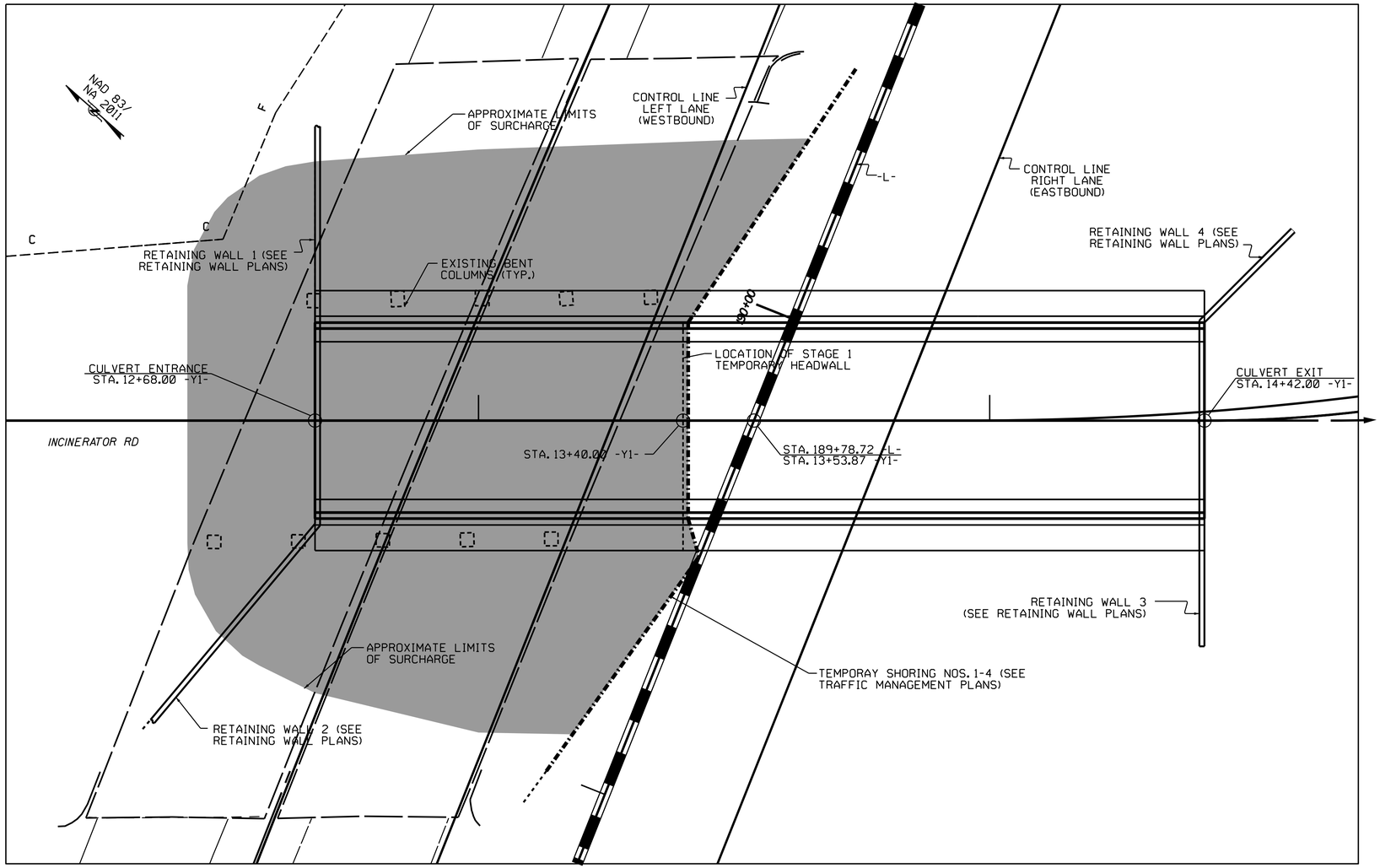

STAGE 2 PLAN VIEW

• NOTE: ACTUAL FOOTING AND PEDESTAL DIMENSIONS TO BE DESIGNED BY THE CONTRACTOR. ESTIMATED SIZES SHOWN ARE FOR BIDDING PURPOSES ONLY.

INDICATES ESTIMATED LIMITS ON SURCHARGE

Stage 2 Sequence:
1) Install 4 settlement gauges to monitor surcharge settlement in accordance to NCDOT Standard 235.01. Operations Engineer and contractor to determine locations at the time of construction.
2) Place surcharge fill to the limits shown on plans.
3) Monitor settlement until a acceptable rate is observed, Operation Engineer will release the removal of Surcharge at this time. If excessive settlement or movement of the existing bridge is observed then remove surcharge fill beneath the existing structure. Provide settlement reading to the NCDOT Operations Engineer on a bi-weekly basis.
4) Remove surcharge and construct Stage 2 Tunnel, and Retaining Wall Nos. 1 and 2.

STAGE 2 SURCHARGE QUANTITIES

BORROW EXCAVATION	8,300 YD
UNCLASSIFIED EXCAVATION	8,300 YD
EMBANKMENT SETTLEMENT GAUGES	4 EA

PREPARED BY:	MHS	DATE:	12/23
REVIEWED BY:	SY/SCC	DATE:	12/23

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SURCHARGE PLAN VIEW STAGE 2

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	-	-	3	-	-
2	-	-	4	-	-

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	2G-3

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 031361 ENGINEER SHIPING YANG

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SIGNATURE DATE

_ ENGINEER

SIGNATURE DATE

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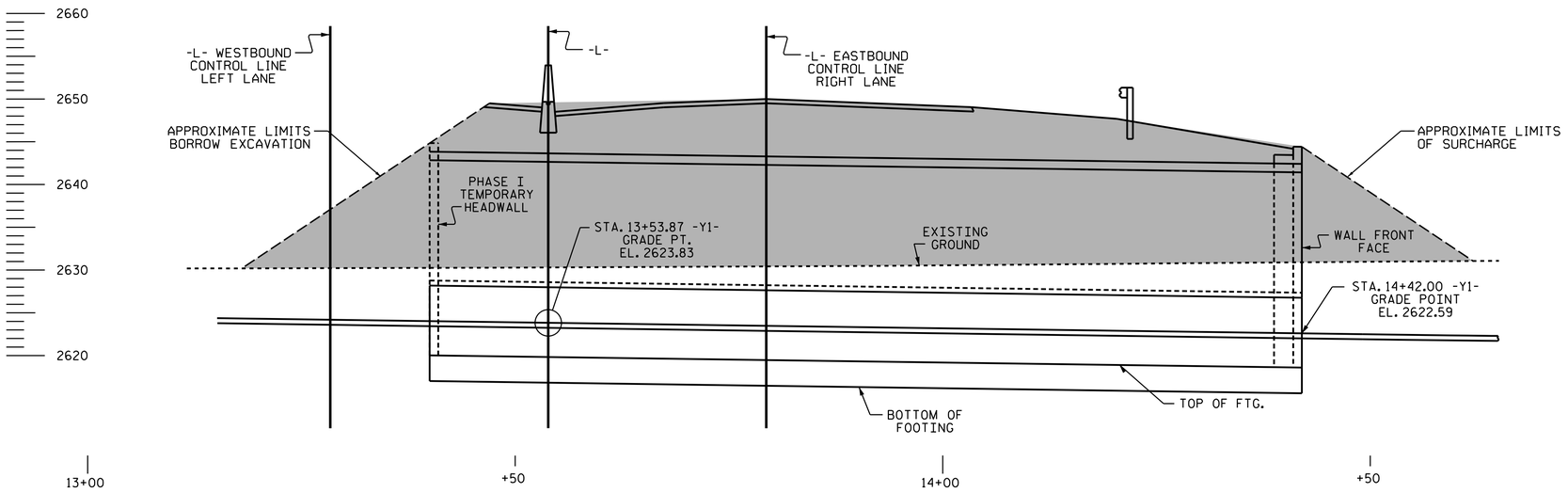
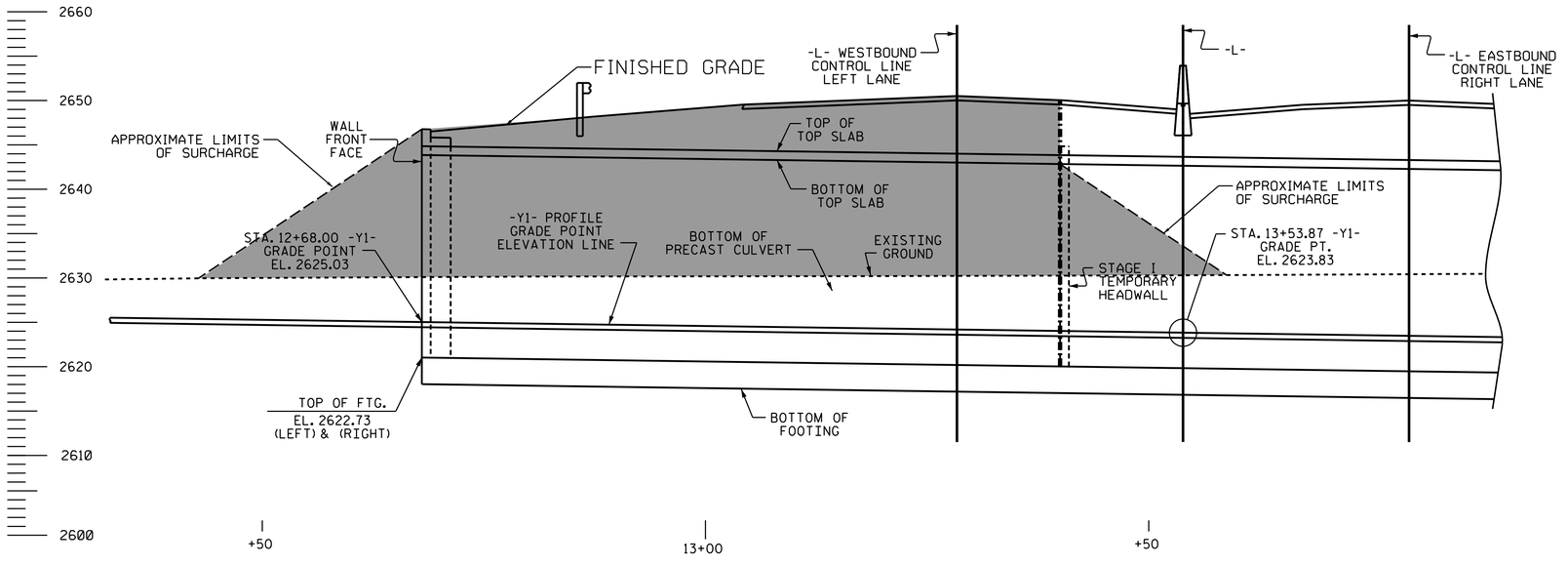


STAGE 1 SECTION ALONG -Y1-

NOTE: ROADWAY SECTION SHOWN IS APPROXIMATE. SEE ROADWAY PLANS FOR ACTUAL SECTION AT THIS LOCATION.

INDICATES ESTIMATED LIMITS ON SURCHARGE



STAGE 2 SECTION ALONG -Y1-

NOTE: ROADWAY SECTION SHOWN IS APPROXIMATE. SEE ROADWAY PLANS FOR ACTUAL SECTION AT THIS LOCATION.

INDICATES ESTIMATED LIMITS ON SURCHARGE

PREPARED BY:	MHS	DATE:	12/23
REVIEWED BY:	SY/SCC	DATE:	12/23

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SURCHARGE PROFILE VIEWS STAGES 1 AND 2

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	-	-	3	-	-
2	-	-	4	-	-

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	2G-4

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 031361 ENGINEER SHIPING YONG

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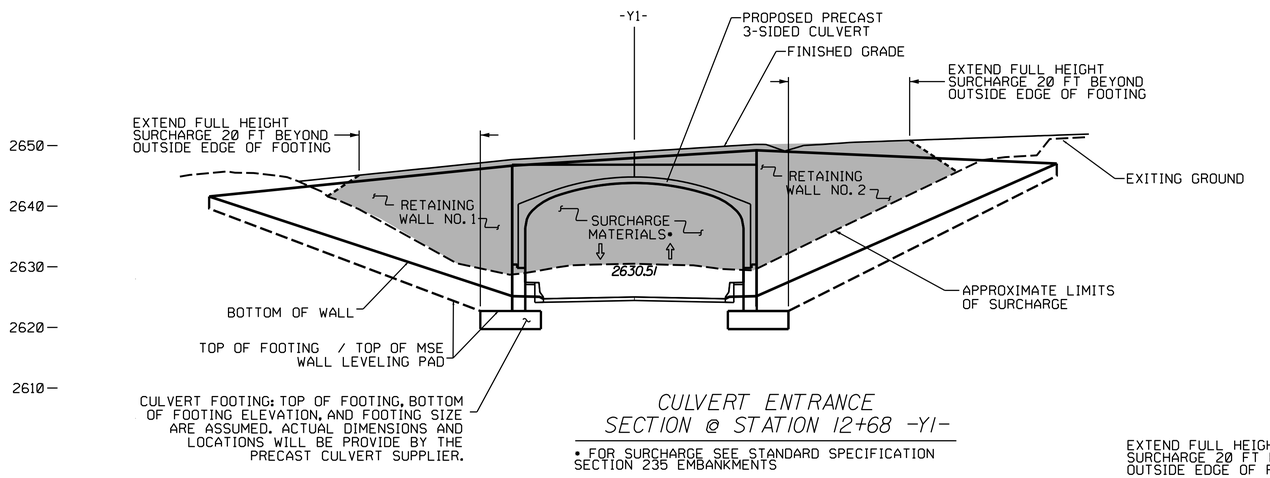
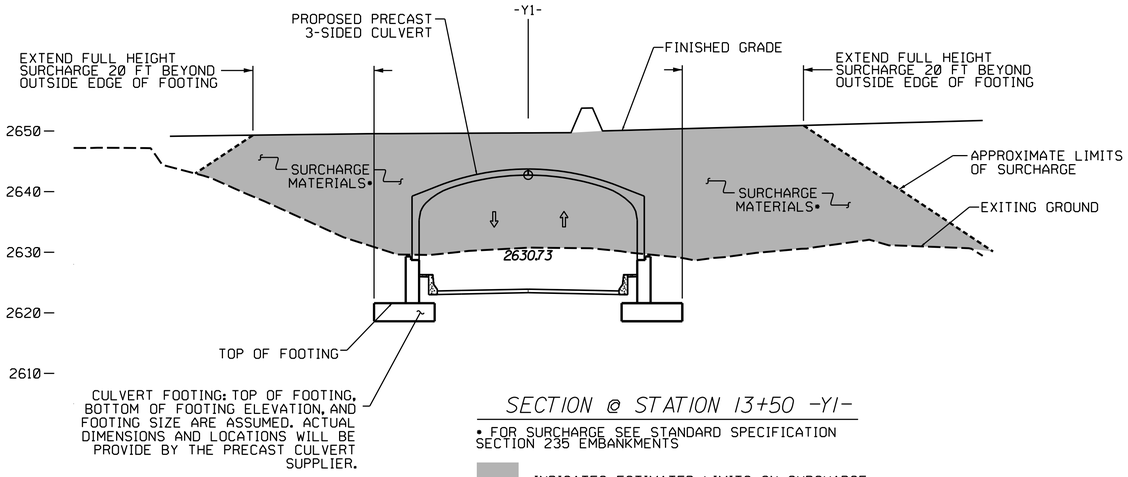


CULVERT ENTRANCE SECTION @ STATION 12+68 -Y1-

• FOR SURCHARGE SEE STANDARD SPECIFICATION SECTION 235 EMBANKMENTS

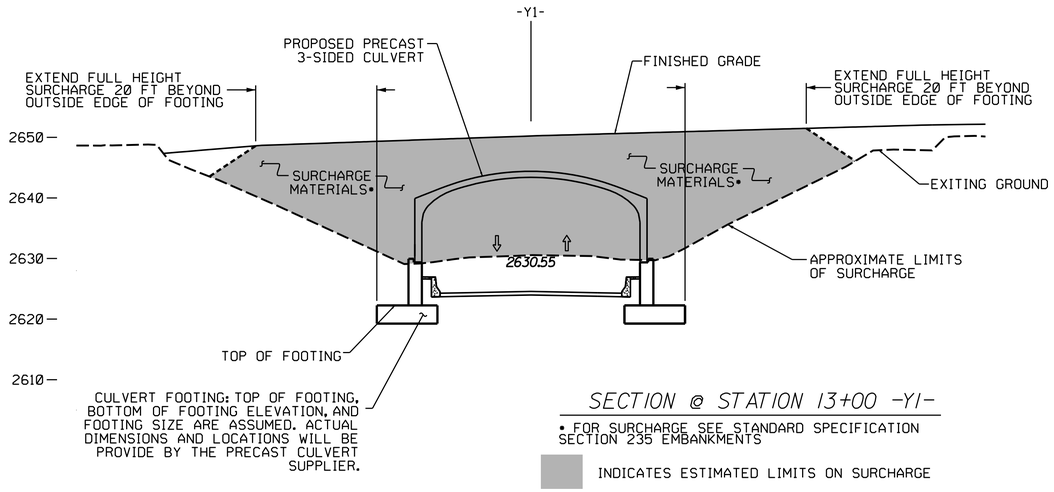
INDICATES ESTIMATED LIMITS ON SURCHARGE



SECTION @ STATION 13+50 -Y1-

• FOR SURCHARGE SEE STANDARD SPECIFICATION SECTION 235 EMBANKMENTS

INDICATES ESTIMATED LIMITS ON SURCHARGE



SECTION @ STATION 13+00 -Y1-

• FOR SURCHARGE SEE STANDARD SPECIFICATION SECTION 235 EMBANKMENTS

INDICATES ESTIMATED LIMITS ON SURCHARGE

PREPARED BY:	MHS	DATE:	12/23
REVIEWED BY:	SY/SCC	DATE:	12/23

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SURCHARGE CROSS SECTIONS

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	-	-	3	-	-
2	-	-	4	-	-

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	2G-5

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 031361 ENGINEER SHIPING YONG

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05/06/2024

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_ ENGINEER

SIGNATURE DATE

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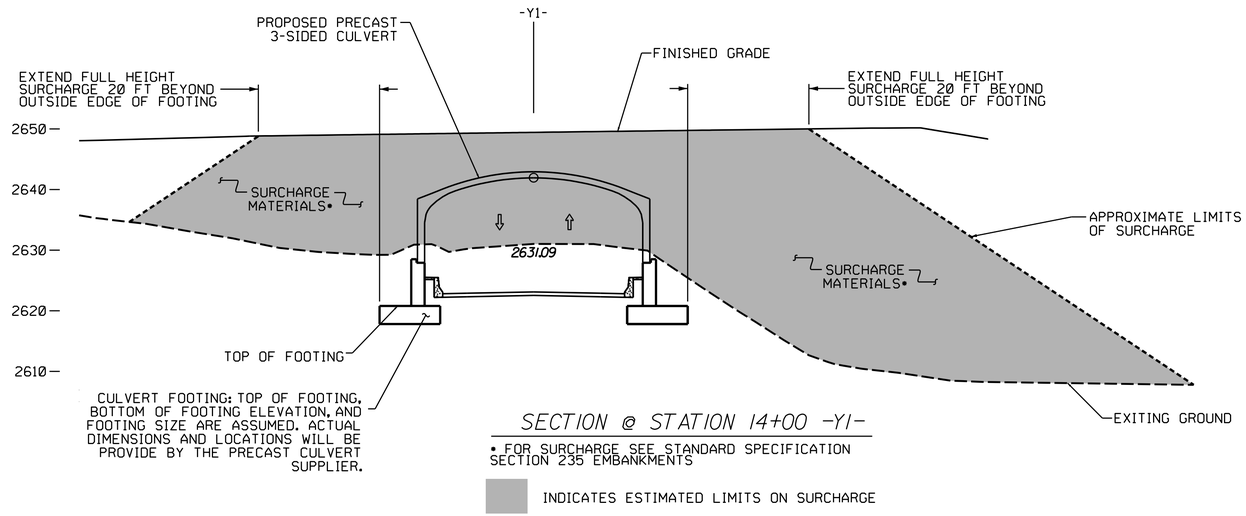
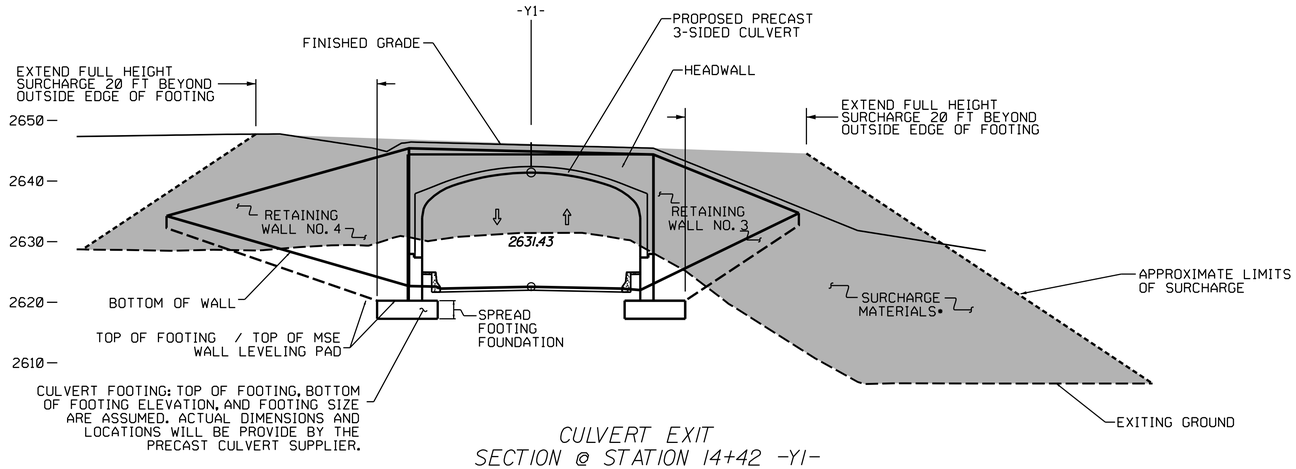


SECTION @ STATION 14+00 -Y1-

• FOR SURCHARGE SEE STANDARD SPECIFICATION SECTION 235 EMBANKMENTS

INDICATES ESTIMATED LIMITS ON SURCHARGE



CULVERT EXIT
SECTION @ STATION 14+42 -Y1-

• FOR SURCHARGE SEE STANDARD SPECIFICATION SECTION 235 EMBANKMENTS

INDICATES ESTIMATED LIMITS ON SURCHARGE

PREPARED BY:	MHS	DATE:	12/23
REVIEWED BY:	SY/SCC	DATE:	12/23

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SURCHARGE CROSS SECTIONS

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	-	-	3	-	-
2	-	-	4	-	-

COMPUTED BY: JAR DATE: 03/13/2024
CHECKED BY: JCH DATE: 03/13/2024

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	3B-1

SUMMARY OF EARTHWORK IN CUBIC YARDS

BEGIN STATION	END STATION	TOTAL UNCLASS.	UNDERCUT	EMBANK. +%	BORROW	WASTE
PHASE 1 (-L- RT)						
-L- 171+40.00 RT	-L- 190+00.00 RT	22,610		53,884	31,274	
-L- 190+00.00 RT	-L- 208+00.00 RT	10,487		14,012	3,525	
-Y1- 10+00.00	-Y1- 20+00.00	9,536		2		9,534
-TMP-DR1- 10+92.38	-TMP-DR1- 14+94.32	1,087		3		1,084
-DR1- 10+25.00	-DR1- 11+50.00	395		9		386
Stage 1 Culvert Surcharge Placement				18,900	18,900	
Stage 1 Culvert Surcharge Removal		18,900				18,900
	SUBTOTAL:	**63,015**		**86,810**	**53,699**	**29,904**
PHASE 2 (-L- MED)						
-L- 171+40.00 MED	-L- 190+00.00 MED	429		359		70
-L- 190+00.00 MED	-L- 208+00.00 MED	445		181		264
Stage 2 Culvert Surcharge Placement				8,300	8,300	
Stage 2 Culvert Surcharge Removal		8,300				8,300
	SUBTOTAL	**9,174**		**8,840**	**8,300**	**8,634**
PHASE 3 (-L- LT)						
-L- 171+40.00 LT	-L- 190+00.00 LT	7,267		3,027		4,240
-L- 190+00.00 LT	-L- 208+00.00 LT	2,596		1,588		1,008
	SUBTOTAL	**9,863**		**4,615**		**5,248**
	TOTAL	**82,052**		**100,265**	**61,999**	**43,786**
MATERIAL FOR SHOULDER CONSTRUCTION				5,750	5,750	
WASTE IN LIEU OF BORROW					-29,904	-29,904
	PROJECT TOTAL	**82,052**		**106,015**	**37,845**	**13,882**
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT					1,893	
	GRAND TOTAL	**82,052**			**39,738**	**13,882**
	SAY	**87,000**			**42,000**	

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

PAVEMENT STRUCTURE VOLUME = 19,997 CUBIC YARDS
EST. DDE = 800 CUBIC YARDS
EST. SHALLOW UNDERCUT = 100 CUBIC YARDS
EST.SHALLOW UNDERCUT BY STATIONS = 0 CUBIC YARDS
TOTAL SHALLOW UNDERCUT = 100 CUBIC YARDS
CLASS IV SUBGRADE STABILIZATION = 200 TONS
PER GEOTECH RECOMMENDATION, EST. 450 CY OF UNDERCUT TO BE USED IN THE DISCRETION OF THE RESIDENT ENGINEER.

SUMMARY OF WOVEN WIRE FENCE, 47" FABRIC

$E = \frac{[\ A - (\ 8B + 16C + 16D\ )\ ]}{14} - (\ C + D + 1\ )$ $\qquad$ $F = (\ 2B + 3C + 3D\ )$

SURVEY LINE	BEGIN STATION	END STATION	LT. OR RT.	A FABRIC (LF)	B END BRACE	C CORNER BRACE	D LINE BRACE	E 4" POSTS	F 5" POSTS	G DOUBLE GATE
-L-	174+54.01	188+36.50	RT.	1,415.00	2	4	2	86	22	
-L-	188+84.30	200+72.93	RT.	1,260.00	2	4	3	73	25	
-Y1-	11+90.00	12+40.00	LT. / RT.	267.00	2	4		8	16	
-TMP-DR1-	14+15.00		RT.	16.00	2				4	1
-TMP-DR1-	14+15.00		LT	16.00	2				4	
			TOTAL:	2,974.00				167	71	1
			SAY:	3,000.00				170	75	1

SUMMARY OF REMOVAL EXISTING ASPHALT PAVEMENT

LINE	STATION	STATION	LOCATION	LENGTH (FT) OR AREA (SF)	WIDTH (FT)	AREA (SY)
-L-	171+40	174+00	LT	260.00	11	317.78
-L-	174+00	BEGIN BRIDGE	LT	32587.00		3620.78
-L-	END BRIDGE	204+50	LT	27822.00		3091.33
-L-	204+50	208+00	LT	350.00	10	388.89
-L-	171+40	174+00	RT	260.00	10	288.89
-L-	174+00	BEGIN BRIDGE	RT	13443.00		1493.67
-L-	END BRIDGE	204+50	RT	14329.00		1592.11
-L-	204+50	208+00	RT	350.00	10	388.89
-Y1- & -DR1-	10+00	20+00	LT&RT	29455.00		3272.78
					TOTAL	14,137.33
					SAY	14,500

SUMMARY OF SHOULDER BERM GUTTER

LINE	LOCATION	BEGIN STATION	END STATION	LENGTH (FT)
-L-	LT	175+38.00	178+63.00	325
-L-	LT	202+75.00	204+50.00	175
-L-	RT	183+96.00	194+91.00	1095
-L-	RT	203+75.00	204+50.00	75
			TOTAL	1,670.00
			SAY	1,700.00

SUMMARY OF CONCRETE BARRIER

LINE	BEGIN STATION	END STATION	LOCATION	VARIABLE HEIGHT SINGLE SLOPE CONCRETE BARRIER (2'-7" Max. Bifurcation) (LF)	VARIABLE HEIGHT SINGLE SLOPE CONCRETE BARRIER (2'-7" THRU 6'-0" Bifurcation) (LF)	PRECAST REINFORCED CONCRETE BARRIER (STD 857.01) (FT)	*CONC. BARRIER TRANSITION SECTION (EA)
-L-	175+00.00	204+50.00	MEDIAN	2,950.00			2*
-Y1-	12+68.00	14+42.00	LT			174.00	
-Y1-	12+68.00	14+42.00	RT			174.00	
			TOTAL:	2,950.00		348.00	2
			SAY:	3,000.00		360.00	2

* Transition from Existing Barrier to Single Slope Concrete Barrier, See Detail Sheet 2C-3

SUMMARY OF GUARDRAIL

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL
G = GATING IMPACT ATTENUATOR MASH TL-3
NG = NON-GATING IMPACT ATTENUATOR MASH TL-3

SURVEY LINE	BEGIN STATION	END STATION	LOCATION	LENGTH: STRAIGHT	LENGTH: SHOP CURVED	LENGTH: DOUBLE FACED	WARRANT POINT: APPROACH END	WARRANT POINT: TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHLD. WIDTH	FLARE LENGTH: APPROACH END	FLARE LENGTH: TRAILING END	W: APPROACH END	W: TRAILING END	ANCHORS: Type B-77	ANCHORS: GREU TL-3	ANCHORS: GREU TL-2	ANCHORS: CAT-1	ANCHORS: AT-1	IMPACT ATTENUATOR MASH, TL-3: NO.	IMPACT ATTENUATOR MASH, TL-3: PERMITTED G	IMPACT ATTENUATOR MASH, TL-3: PERMITTED NG	25' CLEAR SPAN GUARDRAIL SECTIONS (STD. 862.01) (SHT 10 OF 15)	REMOVE EXISTING GUARDRAIL	REMOVE & RESET EXISTING GUARDRAIL	REMARKS
L	175+32.00	177+80.00	LT	247.25			177+80.00	175+32.00	14	17								1						1492		
L	177+80.00	182+00.00	LT	420			182+00.00	177+80.00	26	29		420		12												
L	182+00.00	193+89.00	LT	1189			192+39.00	182+00.00	26	29	50		1			1										
L	202+68.00	208+00.00	LT	531.25			208+00.00	202+68.00	14	17	125		2.5					1						525		Tie to Existing Guardrail on Approach End
L	172+40.00	177+05.00	RT	468.75			175+00.00	177+05.00	14	17	50		1			1		1						500		
L	182+15.00	194+97.25	RT	1281.25			182+50.00	194+97.25	14	17	50		1			1		1						489		
L	201+50.00	208+00.00	RT	650			203+00.00	208+00.00	14	17	50	175	1	3.5		1								651		Tie to Existing Guardrail on Trailing End
Y1	12+07.50	12+68.00	LT	60.375			12+68.00	12+68.00	4	7		25		0.5	1		1									
Y1	14+42.00	15+11.00	LT	60.375			14+42.00	14+42.00	4	7	25		0.5		1		1									
Y1	22+08.64	25+50.00	LT	350			24+50.00	23+00.00	4	7	50	50	1	1		2										
Y1	12+07.50	12+68.00	RT	60.375			12+68.00	12+68.00	4	7	25		0.5		1		1									
Y1	14+42.00	16+16.89	RT	185.375			14+42.00	16+16.89	4	7		25		0.5	1		1									
			SUBTOTAL	5504																						

ANCHOR UNIT DEDUCTIONS

Type	Quantity	Deduction
B-77	4	22.875
GREU-TL3	6	50
GREU-TL2	4	25
CAT-1	4	6.25

			TOTAL	4987.5											4	6	4	4						3657		
			SAY:	5000'			ADDITIONAL GUARDRAIL POSTS: SAY 10 EA								4	6	4	4						3700'		

WEI-JPCKXL3

COMPUTED BY: mlh DATE: 8/23/2023
CHECKED BY: kba DATE: 8/24/2023

PROJECT NO.	SHEET NO.
HB-0003	3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".**

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Side Drain Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE)													
SIZE								6	15	18	24	30	36	42	48						
THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%									DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	DO NOT USE PP PIPE
L 175+05	1 RT	0401		2693.5																	
		0401	0402		2689.0	2686.6															
L 176+00	1 RT	0402		2691.1																	
		0402	0413		2686.6	2685.7															
L 176+00	46 LT	0413		2690.2																	
		0413	0403		2685.7	2680.9	0.4		32												
L 178+10	47 LT	0410		2684.4																	
		0410	0404		2679.9	2678.2															
L 178+60	49 LT	0404		2682.7																	
		0404	0405		2678.2	2678.0			24							X					
L 182+27	76 RT	0406	0409		2667.4	2665.3	0.9				16										
L 182+25	1 LT	0407		2670.3																	
		0407	0408		2665.8	2665.8															
L 182+25	1 RT	0408		2670.6																	
		0408	0409		2665.8	2665.5															
L 182+27	62 RT	0409		2670.5																	
		0409	0415		2664.8	2659.3															
L 184+00	79 RT	0414	0415		2661.5	2660.1			16							X					
L 184+00	62 RT	0415		2664.6																	
		0415	0521		2659.3	2653.4															
L 175+76	73 RT	0411		2678.5																	
		0411	0412		2676.5	2676.4															
L 175+79	70 RT	0412		2678.5																	
L 187+00	1 LT	0501		2656.0																	
		0501	0502		2651.5	2651.4															
L 187+00	1 RT	0502		2655.9																	
		0502	0503		2651.4	2651.1															
L 186+00	62 RT	0521		2658.6																	
		0521	0503		2653.4	2650.4	0.4														
L 187+00	62 RT	0503		2655.9																	
		0503	0504		2650.4	2648.2	0.5														
L 188+00	62 RT	0504		2653.4																	
		0504	0505		2648.2	2609.3	2.0				96					X					
L 192+00	1 LT	0506		2644.8																	
		0506	0507		2640.3	2639.6															
L 192+00	62 RT	0507		2644.1																	
		0507	0510		2639.6	2617.7			40							X					
L 192+31	94 RT	0508																			
		0508	0509		2616.6	2616.5						12									
L 192+26	105 RT	0509		2624.0																	
		0509	0510		2616.5	2616.4						24									
L 192+00	104 RT	0510		2627.0																	
		0510	0512		2616.4	2615.0						104									
Y1 15+00	27 LT	0511		2619.4																	
		0511	0512		2616.7	2616.2			88												
Y1 16+00	27 LT	0512		2620.3																	
		0512	0513		2615.0	2614.7															
Y1 16+00	26 RT	0513		2623.5																	
		0513	0514		2614.7	2604.8						40				X					
L 194+35	62 RT	0515		2636.9																	
SHEET TOTALS									200		112	180									

LINE & STATION	OFFSET	FROM	TO	C. S. PIPE					R. C. PIPE CLASS III								R. C. PIPE CLASS IV							
SIZE				6	15	18	24	30	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48
THICKNESS OR GAUGE				.064	.064	.064	.064	.079																
L 175+05	1 RT	0401																						
		0401	0402															92						
L 176+00	1 RT	0402																						
		0402	0413																					
L 176+00	46 LT	0413																						
		0413	0403																					
L 178+10	47 LT	0410																						
		0410	0404															48						
L 178+60	49 LT	0404																						
		0404	0405																					
L 182+27	76 RT	0406	0409																					
L 182+25	1 LT	0407																						
		0407	0408															4						
L 182+25	1 RT	0408																						
		0408	0409															60						
L 182+27	62 RT	0409																						
		0409	0415																	172				
L 184+00	79 RT	0414	0415																					
L 184+00	62 RT	0415																						
		0415	0521																	196				
L 175+76	73 RT	0411																						
		0411	0412				8																	
L 175+79	70 RT	0412																						
L 187+00	1 LT	0501																						
		0501	0502															4						
L 187+00	1 RT	0502																						
		0502	0503															60						
L 186+00	62 RT	0521																						
		0521	0503																	100				
L 187+00	62 RT	0503																						
		0503	0504																	100				
L 188+00	62 RT	0504																						
		0504	0505																					
L 192+00	1 LT	0506																						
		0506	0507															64						
L 192+00	62 RT	0507																						
		0507	0510																					
L 192+31	94 RT	0508																						
		0508	0509																					
L 192+26	105 RT	0509																						
		0509	0510																					
L 192+00	104 RT	0510																						
		0510	0512																					
Y1 15+00	27 LT	0511																						
		0511	0512																					
Y1 16+00	27 LT	0512																						
		0512	0513										52											
Y1 16+00	26 RT	0513																						
		0513	0514																					
L 194+35	62 RT	0515																						
SHEET TOTALS							8						52					332		568				

LINE & STATION	OFFSET	FROM	TO	15" WELDED STEEL PIPE 0.25" THICK, GRADE B IN SOIL	15" WELDED STEEL PIPE 0.25" THICK, GRADE B NOT IN SOIL	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE MASONRY	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) 0' THRU 5'	A 5' THRU 10'	B 10' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05
						CY	CY	CY	EACH	LIN. FT.	LIN. FT.							
L 175+05	1 RT	0401							1									
		0401	0402															
L 176+00	1 RT	0402							1									
		0402	0413	24	24													
L 176+00	46 LT	0413							1									
		0413	0403															
L 178+10	47 LT	0410							1									
		0410	0404															
L 178+60	49 LT	0404							1									
		0404	0405															
L 182+27	76 RT	0406	0409															
L 182+25	1 LT	0407							1									
		0407	0408															
L 182+25	1 RT	0408							1									
		0408	0409															
L 182+27	62 RT	0409							1	0.8								
		0409	0415															
L 184+00	79 RT	0414	0415															
L 184+00	62 RT	0415							1	0.3								
		0415	0521															
L 175+76	73 RT	0411				1.400												
		0411	0412															
L 175+79	70 RT	0412																
L 187+00	1 LT	0501							1									
		0501	0502															
L 187+00	1 RT	0502							1									
		0502	0503															
L 186+00	62 RT	0521							1	0.3								
		0521	0503															
L 187+00	62 RT	0503							1	0.5								
		0503	0504															
L 188+00	62 RT	0504							1	0.3								
		0504	0505															
L 192+00	1 LT	0506							1									
		0506	0507															
L 192+00	62 RT	0507							1									
		0507	0510															
L 192+31	94 RT	0508																
		0508	0509															
L 192+26	105 RT	0509							1	2.5								
		0509	0510															
L 192+00	104 RT	0510							1	5.0	0.6							
		0510	0512															
Y1 15+00	27 LT	0511							1									
		0511	0512															
Y1 16+00	27 LT	0512							1	0.3								
		0512	0513															
Y1 16+00	26 RT	0513							1	3.8								
		0513	0514															
L 194+35	62 RT	0515							1									
SHEET TOTALS				24	24	1.400			22	13.7	0.6							

LINE & STATION	OFFSET	FROM	TO	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	SPRING BOX STD. 840.41	TRAFFIC BEARING PRECAST DRN. STR. 840.46	M.H. FRAME AND COVER STD. 840.54	M.H. FRAME AND COVER FOR OTCB STD. 840.55	6" CS PIPE ELBOW, 0.064" THICK	15" SIDE DRAIN PIPE ELBOW	24" SIDE DRAIN PIPE ELBOW	30" SIDE DRAIN PIPE ELBOW	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	PIPE REMOVAL	REMARKS
																													CY	CY	LIN. FT.	
L 175+05	1 RT	0401																	1	1									4		17	Remove 15" CMP
		0401	0402																													
L 176+00	1 RT	0402																	1	1												
		0402	0413																													
L 176+00	46 LT	0413																	1	1												
		0413	0403																							2						
L 178+10	47 LT	0410																	1	1												
		0410	0404																													
L 178+60	49 LT	0404																	1	1												
		0404	0405																							2			3			Flowable Fill 15" CMP
L 182+27	76 RT	0406	0409																												14	Remove 18" HDPE
L 182+25	1 LT	0407																	1	1												
		0407	0408																													
L 182+25	1 RT	0408																	1	1												
		0408	0409																													
L 182+27	62 RT	0409						1				1																				
		0409	0415																													
L 184+00	79 RT	0414	0415																													
L 184+00	62 RT	0415						1				1																				
		0415	0521																													
L 175+76	73 RT	0411																														
		0411	0412																													
L 175+79	70 RT	0412																												0.5526		
L 187+00	1 LT	0501																	1	1												
		0501	0502																													
L 187+00	1 RT	0502																	1	1												
		0502	0503																													
L 186+00	62 RT	0521																		1		1										
		0521	0503																													
L 187+00	62 RT	0503																		1		1										
		0503	0504																													
L 188+00	62 RT	0504																		1		1										
		0504	0505																								2		6			Flowable Fill 1@15" CMP
L 192+00	1 LT	0506																	1	1												
		0506	0507																													
L 192+00	62 RT	0507																	1	1												
		0507	0510																							2						
L 192+31	94 RT	0508																												0.6560		
		0508	0509																												21	Remove 30" CMP
L 192+26	105 RT	0509		1																				1								4 OTCB
		0509	0510																													
L 192+00	104 RT	0510		1																				1								4 OTBC
		0510	0512																										40			Flowable Fill 30" CMP
Y1 15+00	27 LT	0511							1					1																		
		0511	0512																													
Y1 16+00	27 LT	0512						1						1																		
		0512	0513																													
Y1 16+00	26 RT	0513													1								1									
		0513	0514																									2				
L 194+35	62 RT	0515							1			1																				
SHEET TOTALS				2				3	2			3		2	1				11	14		3	1	2		6	2	2	53	1.2086	52	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

COMPUTED BY:	mlh	DATE:	8/23/2023
CHECKED BY:	kba	DATE:	8/24/2023

PROJECT NO.	SHEET NO.
HB-0003	3D-2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE) 6	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	DO NOT USE PP PIPE
		0515	0516		2632.4	2631.1															
L 194+88	62 RT	0516		2635.6																	
		0516	0517		2631.1	2630.3			32												
L 196+00	1 LT	0518		2636.0																	
		0518	0519		2630.2	2630.1															
L 196+00	1 RT	0519		2634.6																	
		0519	0520		2630.1	2628.0	0.3														
L 195+77	31 LT	0522		2636.2	EX																
Y1 12+29	70 RT	0523		2644.0																	
		0523	0524		2641.3	2623.9			48							X					
Y1 12+70	68 LT	0525		2638.6																	
		0525	0526		2635.9	2635.8			36												
Y1 14+40	42 RT	0527		2631.7																	
		0527	0528		2629.0	2606.0			40							X					
Y1 14+78	42 LT	0529		2634.3																	
		0529	0530		2631.5	2628.5			20							X					
L 189+30	62 RT	0531		2650.5																	
		0531	0532		2646.0	2643.0															
L 190+65	62 RT	0532		2647.5																	
		0532	0507		2643.0	2639.6															
L 187+88	79 RT	0533																			
		0533	0534																		
L 200+00	1 LT	0601		2627.5																	
		0601	0609		2621.9	2620.8															
L 200+00	55 RT	0609		2625.2																	
		0609	0602		2620.8	2619.5			44												
L 204+40	1 LT	0603		2616.3																	
		0603	0604		2611.8	2611.8															
L 204+40	1 RT	0604		2616.3																	
		0604	0605		2611.8	2611.2															
L 204+40	41 RT	0605		2615.7																	
		0605	0606		2611.2	2594.0	0.5		72							X					
L 204+40	43 LT	0607		2615.4																	
		0607	0608		2610.9	2589.5			64							X					
L 206+60	45 LT	0610		2611.8																	
		0610	0611		2607.3	2604.5			32												
L 207+95	42 RT	0612		2609.4																	
		0612	0613		2604.9	2604.8															
L 207+50	43 RT	0613		2609.6																	
		0613	0614		2604.8	2604.4															
L 206+22	46 RT	0614		2610.5																	
		0614	0615		2604.4	2590.0			56							X					
SHEET TOTALS									444												

FROM	TO	C. S. PIPE 6	15	18	24	30	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	15" WELDED STEEL PIPE 0.25" THICK, GRADE B IN SOIL	15" WELDED STEEL PIPE 0.25" THICK, GRADE B NOT IN SOIL	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY
THICKNESS OR GAUGE		.064	.064	.064	.064	.079																					
0515	0516															52											
0516																											
0516	0517																										
0518																											
0518	0519															4											
0519																											
0519	0520															96											
0522																											
0523																											
0523	0524																										
0525																											
0525	0526																										
0527																											
0527	0528																										
0529																											
0529	0530																										
0531																											
0531	0532															132											
0532																											
0532	0507															136											
0533																											
0533	0534	128																									
0601																											
0601	0609																						30	30			
0609																											
0609	0602																										
0603																											
0603	0604															4											
0604																											
0604	0605																						18	18			
0605																											
0605	0606																										
0607																											
0607	0608																										
0610																											
0610	0611																										
0612																											
0612	0613															44											
0613																											
0613	0614															124											
0614																											
0614	0615																										
SHEET TOTALS		128														592							48	48			

FROM	TO	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22
0515	0516																					
0516		1															1			1		
0516	0517																					
0518		1	0.8																			
0518	0519																					
0519		1																				
0519	0520																					
0522		1																				
0523		1															1			1		
0523	0524																					
0525		1															1			1		
0525	0526																					
0527		1															1			1		
0527	0528																					
0529		1															1			1		
0529	0530																					
0531		1																				
0531	0532																					
0532		1																				
0532	0507																					
0533		1																				
0533	0534																					
0601		1																				
0601	0609																					
0609		1																				
0609	0602																					
0603		1																				
0603	0604																					
0604		1																				
0604	0605																					
0605		1																				
0605	0606																					
0607		1																				
0607	0608																					
0610		1																				
0610	0611																					
0612		1																				
0612	0613																					
0613		1																				
0613	0614																					
0614		1	1.1																			
0614	0615																					
SHEET TOTALS		21	1.9														5			5		

FROM	TO	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	SPRING BOX STD. 840.41	TRAFFIC BEARING PRECAST DRN. STR. 840.46	M.H. FRAME AND COVER STD. 840.54	M.H. FRAME AND COVER FOR OTCB STD. 840.55	6" CS PIPE ELBOW, 0.064" THICK	15" SIDE DRAIN PIPE ELBOW	24" SIDE DRAIN PIPE ELBOW	30" SIDE DRAIN PIPE ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
0515	0516																		
0516																			
0516	0517																		
0518						1	1												
0518	0519																		
0519						1	1												
0519	0520																		
0522				1															SLAB LID
0523																			
0523	0524												2						
0525																			
0525	0526																		
0527																			
0527	0528												2						
0529																			
0529	0530																		
0531						1	1												
0531	0532																		
0532						1	1												
0532	0507																		
0533								1											
0533	0534											2							
0601						1	1												
0601	0609																		
0609		1								1									
0609	0602																		
0603						1	1												
0603	0604																		
0604						1	1												
0604	0605																		
0605						1	1												
0605	0606												2						
0607						1	1												
0607	0608												2						
0610						1	1												
0610	0611																		
0612						1	1												
0612	0613																		
0613						1	1												
0613	0614																		
0614						1	1												
0614	0615												2						
SHEET TOTALS		1		1		13	13	1		1		2	10						

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

WEI-JPCKXL3

COMPUTED BY:	mlh	DATE:	8/23/2023
CHECKED BY:	kba	DATE:	8/24/2023

PROJECT NO.	SHEET NO.
HB-0003	3D-3

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION	OFFSET		STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Side Drain Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE)														C. S. PIPE					R. C. PIPE CLASS III								R. C. PIPE CLASS IV							
SIZE									6	15	18	24	30	36	42	48							6	15	18	24	30	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48
THICKNESS OR GAUGE			FROM	TO	FT.	FT.	FT.	%									DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	DO NOT USE PP PIPE	.064	.064	.064	.064	.079																
L 180+96	21	LT	T406		2674.5																																						
			T406	T407		2670.5	2665.8																														128						
L 182+25	20	LT	T407		2670.1																																						
			T407	0409		2670.1	2664.8																														16						
L 182+25	13	RT	T408		2670.6	2665.7																																					
L 188+85	15	LT	T531	0531		2646.8	2646.0																														88						
L 188+59	76	RT	T501	T502		2605.8	2605.0			92											X	X																					
L 196+00	7	LT	T518		2635.6																																						
			T518	0520		2630.1	2628.0																														4						
L 200+00	12	RT	T601		2626.8																																						
			T601	0601		2622.1	2621.9																														16						
SHEET TOTALS										92																											252						
PROJECT TOTALS										736		112	180										128			8						52					1176		568				

LINE & STATION	FROM	TO	15" WELDED STEEL PIPE 0.25" THICK, GRADE B IN SOIL	15" WELDED STEEL PIPE 0.25" THICK, GRADE B NOT IN SOIL	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE MASONRY	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) 0' THRU 5'	A 5' THRU 10'	B 10' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	CONCRETE TRANSITIONAL SECTION C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	SPRING BOX STD. 840.41	TRAFFIC BEARING PRECAST DRN. STR. 840.46	M.H. FRAME AND COVER STD. 840.54	M.H. FRAME AND COVER FOR OTCB STD. 840.55	6" CS PIPE ELBOW, 0.064" THICK	15" SIDE DRAIN PIPE ELBOW	24" SIDE DRAIN PIPE ELBOW	30" SIDE DRAIN PIPE ELBOW	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	PIPE REMOVAL	REMARKS
					CY	CY	CY	EACH	LIN. FT.	LIN. FT.																																	CY	CY	LIN. FT.	
L 180+96	T406							1																									1	1												TEMPORARY INLET TO BE REMOVED WITH DETOUR
	T406	T407																																											128	TEMPORARY PIPE TO BE REMOVED WITH DETOUR
L 182+25	T407							1																									1	1												TEMPORARY INLET TO BE REMOVED WITH DETOUR
	T407	0409																																											16	TEMPORARY PIPE TO BE REMOVED WITH DETOUR
L 182+25	T408							1																									1	1												TEMPORARY INLET TO BE REMOVED WITH DETOUR
L 188+85	T531	0531																																											88	TEMPORARY PIPE TO BE REMOVED WITH DETOUR
L 188+59	T501	T502																																										0.3990	92	TEMPORARY PIPE TO BE REMOVED WITH DETOUR
L 196+00	T518							1																									1	1												TEMPORARY INLET TO BE REMOVED WITH DETOUR
	T518	0520																																											4	TEMPORARY PIPE TO BE REMOVED WITH DETOUR
L 200+00	T601							1																									1	1												TEMPORARY INLET TO BE REMOVED WITH DETOUR
	T601	0601																																											16	TEMPORARY PIPE TO BE REMOVED WITH DETOUR
SHEET TOTALS								5																									5	5										0.3990	344	
PROJECT TOTALS			72	72	1.400			48	16.4									2				3	7			8		2	2		1		29	32	1	3	2	2	2	16	2	2	53	1.6076	396	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

COMPUTED BY: D. Matt Mullen, PE DATE: 07/07/2023
CHECKED BY: Shiping Wang, PhD, PE DATE: 12/20/2023

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	3G-1

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
(2-3-23)

SUMMARY OF SUBSURFACE DRAINAGE

LINE	STATION	STATION	LOCATION (LT/RT/CL)	DRAIN TYPE (UD/BD/SD)	LENGTH (LF)
CONTINGENCY				SD	200
				TOTAL	200

*UD = Underdrain
*BD = Blind Drain
*SD = Subsurface Drain

SUMMARY OF AGGREGATE SUBGRADE / STABILIZATION

LINE	STATION	STATION	Aggregate Type* ASU(1/2)/AST	Aggregate Thickness [8" for ASU(2)] (INCHES)	Shallow Undercut (CY)	Class IV Subgrade Stabilization (TONS)	Geotextile for Subgrade Stabilization (SY)	Stabilizer Aggregate (TONS)	Class IV Aggregate Stabilization (TONS)
CONTINGENCY			ASU(1)	12	100	200	300		
				TOTAL (CY/TONS/SY):	100	200**	300**		

*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)
*AST = Aggregate Stabilization
**Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Subgrade Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

SUMMARY OF SETTLEMENT GAUGES

GAUGE No.	Stage	Offset	
		Distance FT	Direction LT/RT
1-4	1	See 2G Surcharge Plans	
5-8	2		
TOTAL GAUGES (EACH):			8

SUMMARY OF SURCHARGES AND SURCHARGE WAITING PERIODS

LINE	Station	Station	Surcharge Elevation (Average)	MONTHS
-Y1- Stage 1	13+40	14+42	2648	2
-Y1- Stage 2	12+68	13+40	2647	2

* See 2G Surcharge Plans for addition information.

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	3P-1

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PARCEL INDEX SHEET

PARCEL NO.	SHEET NO.	PROPERTY OWNER NAME
1	4, 5, 6	BLUE RIDGE PAPER PRODUCTS INC.

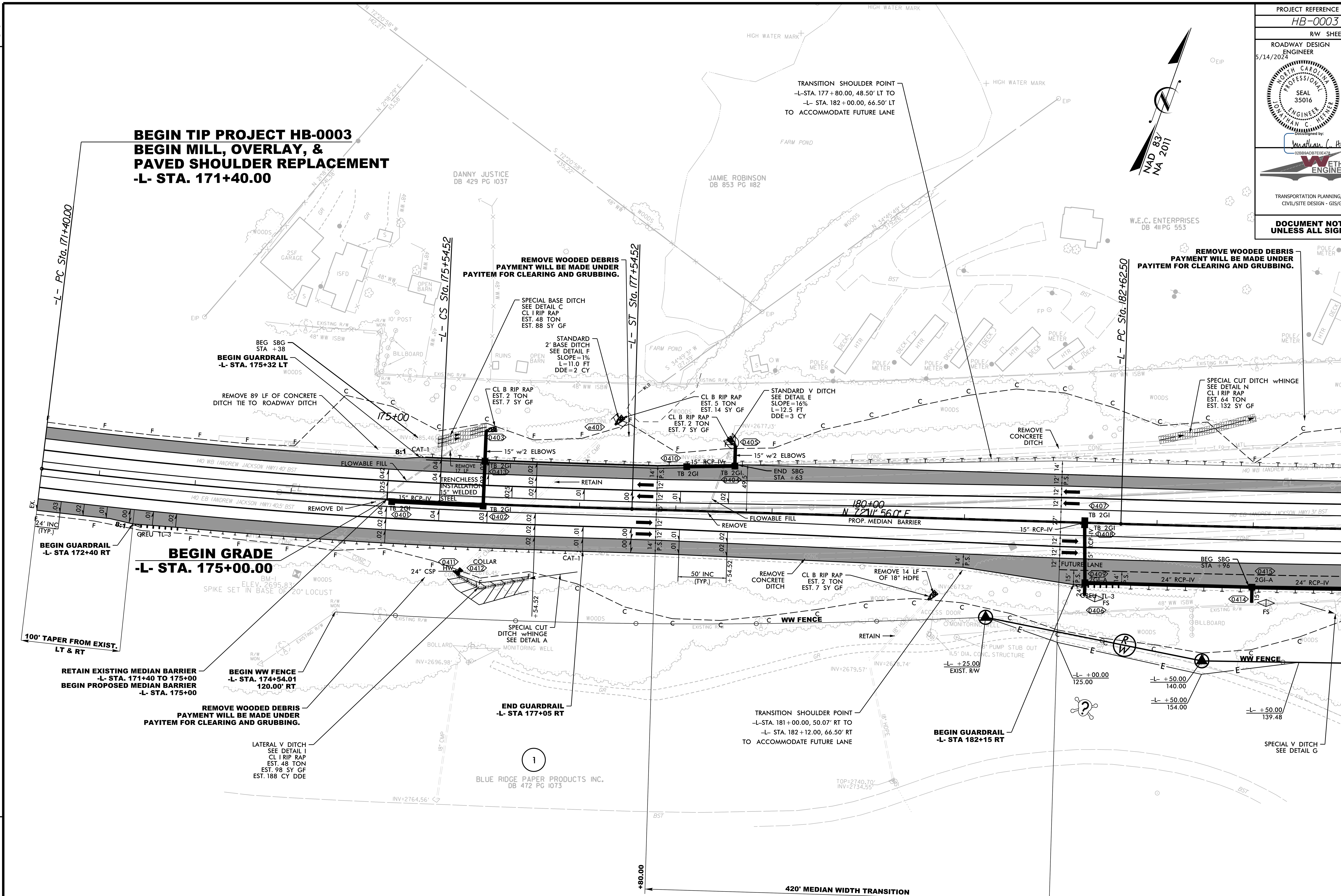
PROJECT REFERENCE NO.	SHEET NO.
HB-0003	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER 5/14/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35016 JONATHAN C. HEFNER

HYDRAULICS ENGINEER 5/14/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 053425 MATTHEW L. HARVEY

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED


BEGIN TIP PROJECT HB-0003
BEGIN MILL, OVERLAY, & PAVED SHOULDER REPLACEMENT
-L- STA. 171+40.00
NAD 83/ NA 2011
DANNY JUSTICE DB 429 PG 1037
JAMIE ROBINSON DB 853 PG 1182
W.E.C. ENTERPRISES DB 411 PG 553
BLUE RIDGE PAPER PRODUCTS INC. DB 472 PG 1073
TRANSITION SHOULDER POINT -L-STA. 177+80.00, 48.50' LT TO -L- STA. 182+00.00, 66.50' LT TO ACCOMMODATE FUTURE LANE
REMOVE WOODED DEBRIS PAYMENT WILL BE MADE UNDER PAYITEM FOR CLEARING AND GRUBBING.
SPECIAL BASE DITCH SEE DETAIL C CL I RIP RAP EST. 48 TON EST. 88 SY GF
STANDARD 2' BASE DITCH SEE DETAIL F SLOPE=1% L=11.0 FT DDE=2 CY
BEG SBG STA +38
BEGIN GUARDRAIL -L- STA. 175+32 LT
REMOVE 89 LF OF CONCRETE DITCH TIE TO ROADWAY DITCH
CL B RIP RAP EST. 2 TON EST. 7 SY GF
CL B RIP RAP EST. 5 TON EST. 14 SY GF
STANDARD V DITCH SEE DETAIL E SLOPE=16% L=12.5 FT DDE=3 CY
SPECIAL CUT DITCH w/HINGE SEE DETAIL N CL I RIP RAP EST. 64 TON EST. 132 SY GF
REMOVE CONCRETE DITCH
15" w/2 ELBOWS
END SBG STA +63
TRENCHLESS INSTALLATION 15" WELDED STEEL
FLOWABLE FILL
RETAIN
REMOVE DI
PROP. MEDIAN BARRIER
N 72°11'56.0" E
BEGIN GUARDRAIL -L- STA 172+40 RT
BEGIN GRADE -L- STA. 175+00.00
100' TAPER FROM EXIST. LT & RT
24' INC (TYP.)
50' INC (TYP.)
FUTURE LANE
BEG SBG STA +96
REMOVE 14 LF OF 18" HDPE
WW FENCE
RETAIN EXISTING MEDIAN BARRIER -L- STA. 171+40 TO 175+00
BEGIN PROPOSED MEDIAN BARRIER -L- STA. 175+00
BEGIN WW FENCE -L- STA. 174+54.01 120.00' RT
SPECIAL CUT DITCH w/HINGE SEE DETAIL A
END GUARDRAIL -L- STA 177+05 RT
LATERAL V DITCH SEE DETAIL I CL I RIP RAP EST. 48 TON EST. 98 SY GF EST. 188 CY DDE
TRANSITION SHOULDER POINT -L-STA. 181+00.00, 50.07' RT TO -L- STA. 182+12.00, 66.50' RT TO ACCOMMODATE FUTURE LANE
BEGIN GUARDRAIL -L- STA 182+15 RT
SPECIAL V DITCH SEE DETAIL G
420' MEDIAN WIDTH TRANSITION
-L- PC Sta. 171+40.00
-L- CS Sta. 175+54.52
-L- ST Sta. 177+54.52
-L- PC Sta. 182+62.50
MATCHLINE -L- STA. 185+00 SEE SHEET 5

-L- CURVE DATA		
PI Sta 173+47.35	PIs Sta 176+21.18	PI Sta 184+81.87
Δ = 4° 08' 42.6" (LT)	Θs = 1° 00' 00.0"	Δ = 1° 44' 00.6" (LT)
D = 1° 00' 00.0"	Ls = 200.00'	D = 0° 23' 42.5"
L = 414.52'	LT = 133.34'	L = 438.70'
T = 207.35'	ST = 66.67'	T = 219.37'
R = 5,729.58'		R = 14,500.00'
SE = .04		SE = NC
DS = 70 MPH		DS = 70 MPH

FOR DRAINAGE DETAILS, SEE SHEET 2D-1
FOR PROP. MEDIAN BARRIER DETAILS, SEE SHEETS 2C-1 THRU 2C-3
FOR -L- PROFILES, SEE SHEET NO. 7

REVISIONS

5/13/2024 ...\HB0003_rdy_psh_04.dgn

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — 5/14/2024 — NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER JONATHAN C. HEFNER — DocuSigned by: Jonathan C. Hefner 02BB9ADB7E0E478...

HYDRAULICS ENGINEER — 5/14/2024 — NORTH CAROLINA PROFESSIONAL SEAL 053425 ENGINEER MATTHEW L. HARVEY — DocuSigned by: Matthew L. Harvey DB419C2087B94EE...

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

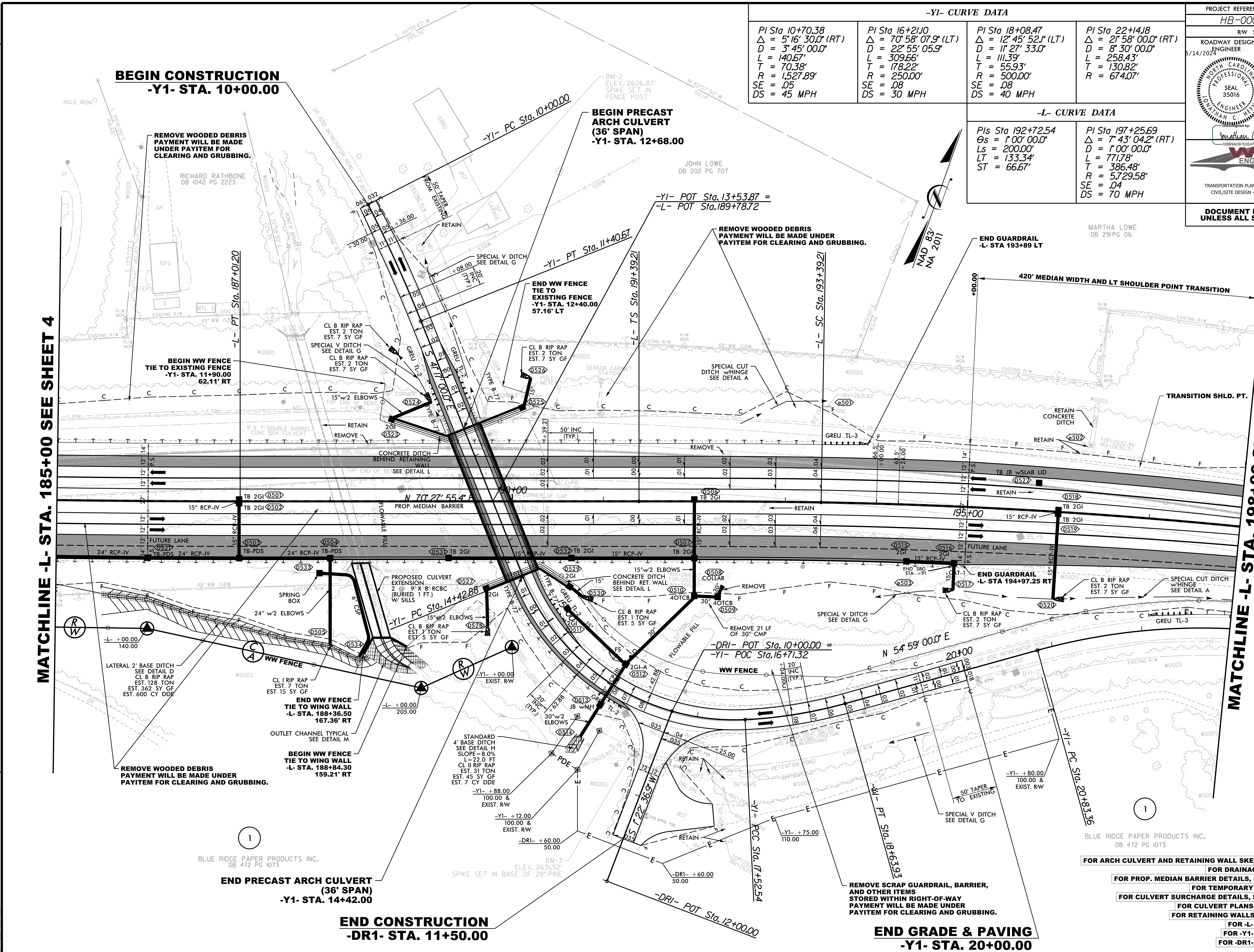
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-Y1- CURVE DATA

PI Sta 10+70.38	PI Sta 16+21.10	PI Sta 18+08.47	PI Sta 22+14.18
Δ = 5° 16′ 30.0″ (RT)	Δ = 70° 58′ 07.9″ (LT)	Δ = 12° 45′ 52.1″ (LT)	Δ = 21° 58′ 00.0″ (RT)
D = 3° 45′ 00.0″	D = 22° 55′ 05.9″	D = 11° 27′ 33.0″	D = 8° 30′ 00.0″
L = 140.67′	L = 309.66′	L = 111.39′	L = 258.43′
T = 70.38′	T = 178.22′	T = 55.93′	T = 130.82′
R = 1,527.89′	R = 250.00′	R = 500.00′	R = 674.07′
SE = .05	SE = .08	SE = .08	
DS = 45 MPH	DS = 30 MPH	DS = 40 MPH	

-L- CURVE DATA

PIs Sta 192+72.54	PI Sta 197+25.69
Θs = 1° 00′ 00.0″	Δ = 7° 43′ 04.2″ (RT)
Ls = 200.00′	D = 1° 00′ 00.0″
LT = 133.34′	L = 771.78′
ST = 66.67′	T = 386.48′
	R = 5,729.58′
	SE = .04
	DS = 70 MPH


BEGIN CONSTRUCTION
-Y1- STA. 10+00.00
BEGIN PRECAST ARCH CULVERT (36′ SPAN) -Y1- STA. 12+68.00
-Y1- PC Sta. 10+00.00
-Y1- PT Sta. 11+40.67
-Y1- POT Sta. 13+53.87 =
-L- POT Sta. 189+78.72
REMOVE WOODED DEBRIS PAYMENT WILL BE MADE UNDER PAYITEM FOR CLEARING AND GRUBBING.
END WW FENCE TIE TO EXISTING FENCE -Y1- STA. 12+40.00 57.16′ LT
BEGIN WW FENCE TIE TO EXISTING FENCE -Y1- STA. 11+90.00 62.11′ RT
-L- PT Sta. 187+01.20
-L- TS Sta. 191+39.21
-L- SC Sta. 193+39.21
END GUARDRAIL -L- STA 193+89 LT
420′ MEDIAN WIDTH AND LT SHOULDER POINT TRANSITION
TRANSITION SHLD. PT.
NAD 83/ NA 2011
RICHARD RATHBONE DB 1042 PG 2223
JOHN LOWE DB 202 PG 707
MARTHA LOWE DB 291 PG 06
BM-2 ELEV. 2626.87′ SPIKE SET IN FENCE POST
MATCHLINE -L- STA. 185+00 SEE SHEET 4
MATCHLINE -L- STA. 198+00 SEE SHEET 6
N 70° 27′ 55.4″ E
PROP. MEDIAN BARRIER
FUTURE LANE
195+00
END GUARDRAIL -L- STA 194+97.25 RT
SPECIAL CUT DITCH w/HINGE SEE DETAIL A
SPECIAL V DITCH SEE DETAIL G
CONCRETE DITCH BEHIND RETAINING WALL SEE DETAIL L
PROPOSED CULVERT EXTENSION 2 @ 9′ X 8′ RCBC (BURIED 1 FT.) W/ SILLS
-Y1- PC Sta. 14+42.88
-DR1- POT Sta. 10+00.00 =
-Y1- POC Sta. 16+71.32
N 54° 59′ 00.0″ E
20+00
REMOVE 21 LF OF 30″ CMP
LATERAL 2′ BASE DITCH SEE DETAIL D CL B RIP RAP EST. 128 TON EST. 362 SY GF EST. 600 CY DDE
END WW FENCE TIE TO WING WALL -L- STA. 188+36.50 167.36′ RT
OUTLET CHANNEL TYPICAL SEE DETAIL M
BEGIN WW FENCE TIE TO WING WALL -L- STA. 188+84.30 159.21′ RT
STANDARD 4′ BASE DITCH SEE DETAIL H SLOPE=8.0% L=22.0 FT CL II RIP RAP EST. 31 TON EST. 45 SY GF EST. 7 CY DDE
-Y1- PT Sta. 18+63.93
-Y1- PCC Sta. 17+52.54
-Y1- PC Sta. 20+83.36
-DR1- POT Sta. 12+00.00
REMOVE SCRAP GUARDRAIL, BARRIER, AND OTHER ITEMS STORED WITHIN RIGHT-OF-WAY PAYMENT WILL BE MADE UNDER PAYITEM FOR CLEARING AND GRUBBING.
BLUE RIDGE PAPER PRODUCTS INC. DB 472 PG 1073
BM-3 ELEV. 2631.52′ SPIKE SET IN BASE OF 28″ PINE
END PRECAST ARCH CULVERT (36′ SPAN) -Y1- STA. 14+42.00
END CONSTRUCTION
-DR1- STA. 11+50.00
END GRADE & PAVING
-Y1- STA. 20+00.00

FOR ARCH CULVERT AND RETAINING WALL SKETCH, SEE INSET ON SHEET 6
FOR DRAINAGE DETAILS, SEE SHEET 2D-1
FOR PROP. MEDIAN BARRIER DETAILS, SEE SHEETS 2C-1 THRU 2C-3
FOR TEMPORARY DRIVEWAY, SEE SHEET 2B-4
FOR CULVERT SURCHARGE DETAILS, SEE SHEETS 2G-1 THRU 2G-5
FOR CULVERT PLANS, SEE SHEETS C-1 THRU C-10
FOR RETAINING WALLS, SEE SHEETS W-1 THRU W-4
FOR -L- PROFILES, SEE SHEET NO. 8
FOR -Y1- PROFILE, SEE SHEET NO. 10
FOR -DR1- PROFILE, SEE SHEET NO. 10

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
HB-0003	6

R/W SHEET NO.

ROADWAY DESIGN ENGINEER — 5/14/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35016 JONATHAN C. HEFNER — Jonathan C. Hefner

HYDRAULICS ENGINEER — 5/14/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 053425 MATTHEW L. HARVEY — Matthew L. Harvey

WETHERILL ENGINEERING
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TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

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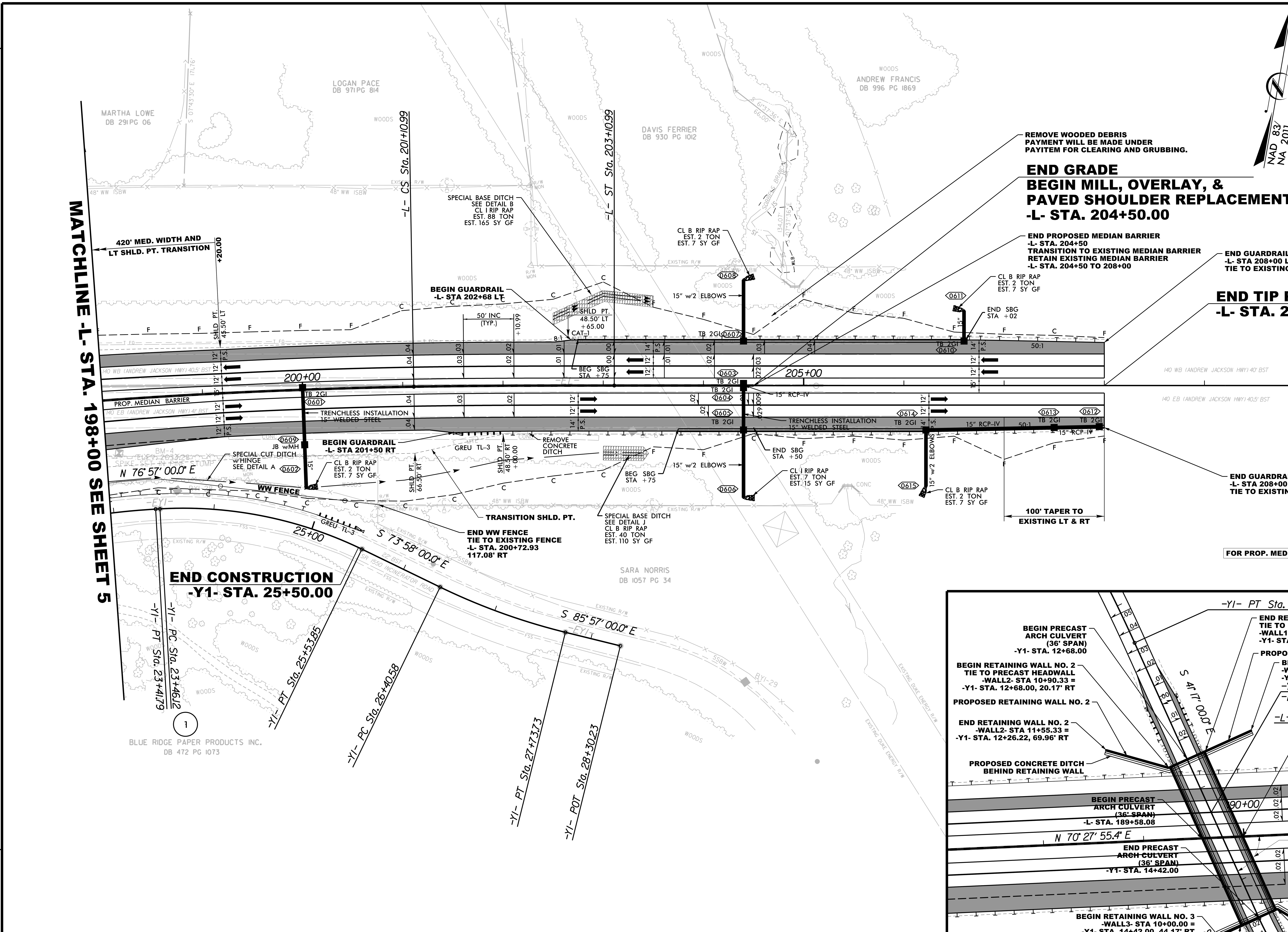
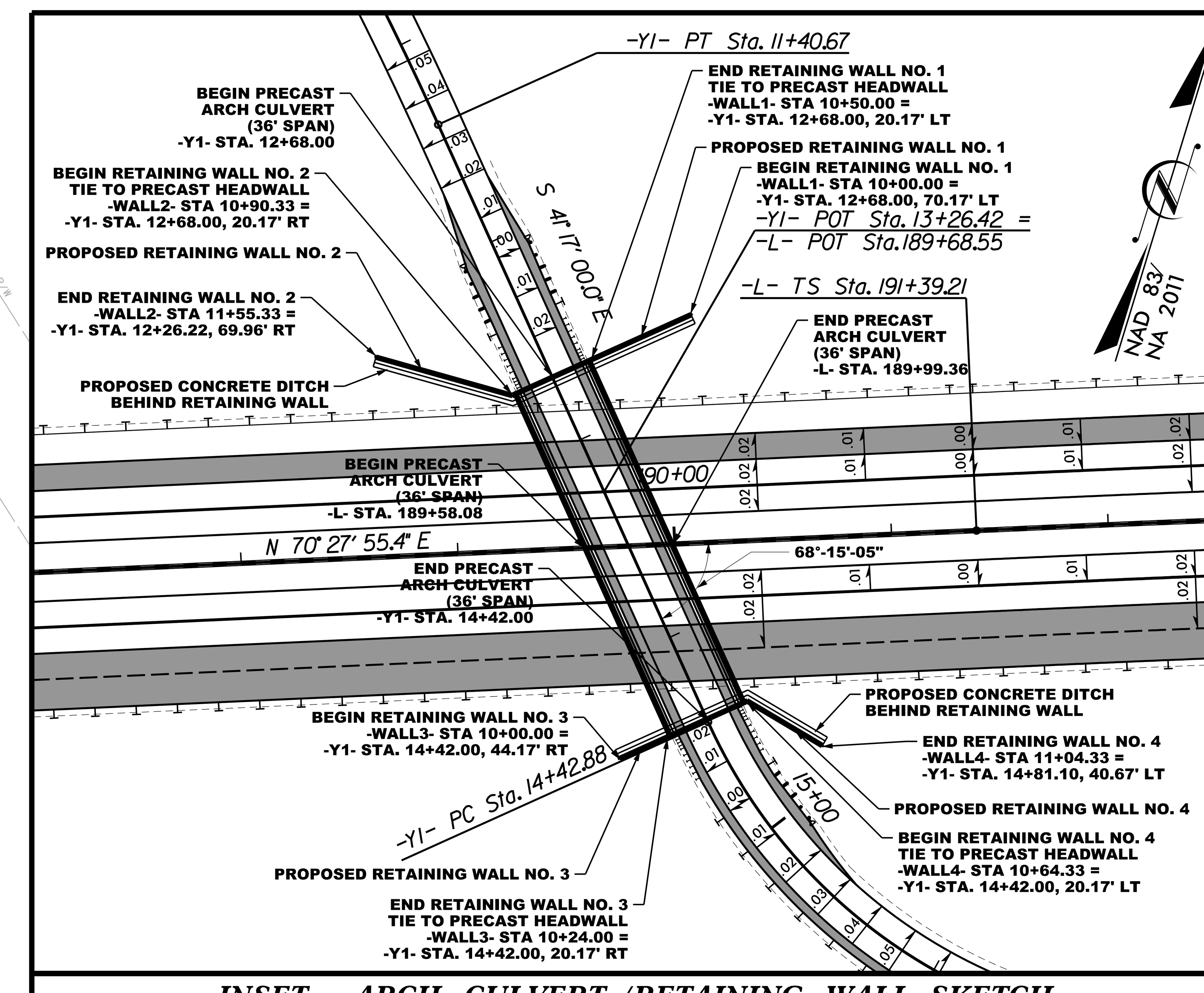


REVISIONS

FOR DRAINAGE DETAILS, SEE SHEET 2D-1
FOR PROP. MEDIAN BARRIER DETAILS, SEE SHEETS 2C-1 THRU 2C-3
FOR -L- PROFILES, SEE SHEET NO. 9

-L- CURVE DATA		-Y1- CURVE DATA		
PI Sta 197+25.69	PIs Sta 201+77.66	PI Sta 22+14.18	PI Sta 24+52.28	PI Sta 27+07.40
Δ = 7° 43' 04.2" (RT)	Θs = 1° 00' 00.0"	Δ = 21° 58' 00.0" (RT)	Δ = 29° 05' 00.0" (RT)	Δ = 11° 59' 00.0" (LT)
D = 1° 00' 00.0"	Ls = 200.00'	D = 8° 30' 00.0"	D = 14° 00' 00.0"	D = 9° 00' 00.0"
L = 771.78'	LT = 133.34'	L = 258.43'	L = 207.74'	L = 133.15'
T = 386.48'	ST = 66.67'	T = 130.82'	T = 106.16'	T = 66.82'
R = 5,729.58'		R = 674.07'	R = 409.26'	R = 636.62'
SE = .04				
DS = 70 MPH				



INSET – ARCH CULVERT /RETAINING WALL SKETCH

5/13/2024 ...\HB0003_rdy_psh_06.dgn

5/28/99

–L– WESTBOUND

I-40 WESTBOUND

BEGIN GRADE
-L- STA. 175+00.00
EL = 2693.57'

PI = 177+00.00
EL = 2,688.71'
VC = 400'
K = 430
DS = 80 MPH

(–)2.4300%

(–)3.3600%

(–)14.56%

BEGIN SPECIAL BASE DITCH
-L- STA 175+50 LT
EL=2688.15

END SPECIAL BASE DITCH
-L- STA 176+00 LT
EL=2680.87

PROPOSED GRADE

EXISTING GROUND
(25.5' LT OF -L-)

BEGIN SPECIAL CUT DITCH w/HINGE
-L- STA 183+00 LT
EL=2663.80

(–)12.50%

END SPECIAL CUT DITCH w/HINGE
-L- STA 184+00 LT
EL=2651.20

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	7

ROADWAY DESIGN ENGINEER
5/14/2024
NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER JONATHAN C. HEFNER
DocuSigned by: Jonathan C. Hefner

HYDRAULICS ENGINEER
5/14/2024
NORTH CAROLINA PROFESSIONAL SEAL 053425 ENGINEER MATTHEW L. HARVEY
DocuSigned by: Matthew L. Harvey
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2720 2710 2700 2690 2680 2670 2660 2650 2640 2630

172+00 173+00 174+00 175+00 176+00 177+00 178+00 179+00 180+00 181+00 182+00 183+00 184+00 185+00

–L– EASTBOUND

I-40 EASTBOUND

BEGIN GRADE
-L- STA. 175+00.00
EL = 2694.35'

PI = 177+00.00
EL = 2,689.36'
VC = 400'
K = 423
DS = 80 MPH

(–)2.4950%

(–)3.4400%

(+)10.50%

(+)3.40%

BEGIN LATERAL V DITCH
-L- STA 175+76 RT
EL=2676.50

END LATERAL V DITCH
BEGIN SPECIAL CUT DITCH w/HINGE
-L- STA 176+50 RT
EL=2684.27

END SPECIAL CUT DITCH w/HINGE
-L- STA 177+00 RT
EL=2685.97

EXISTING GROUND
(25.5' RT OF -L-)

PROPOSED GRADE

BEGIN SPECIAL V DITCH
-L- STA 184+50 RT
EL=2660.00

(–)10.00%

BM#1 ELEV. 2695.83'
-L- STA. 174+12.16, 83.38' RT.
SPIKE SET IN BASE OF 20" LOCUST

2720 2710 2700 2690 2680 2670 2660 2650 2640 2630

172+00 173+00 174+00 175+00 176+00 177+00 178+00 179+00 180+00 181+00 182+00 183+00 184+00 185+00

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PROJECT REFERENCE NO.	SHEET NO.
HB-0003	8

ROADWAY DESIGN ENGINEER — 5/14/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35016 JONATHAN C. HEFNER — DocuSigned by: Jonathan C. Hefner

HYDRAULICS ENGINEER — 5/14/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 053425 MATTHEW L. HARVEY — DocuSigned by: Matthew L. Harvey

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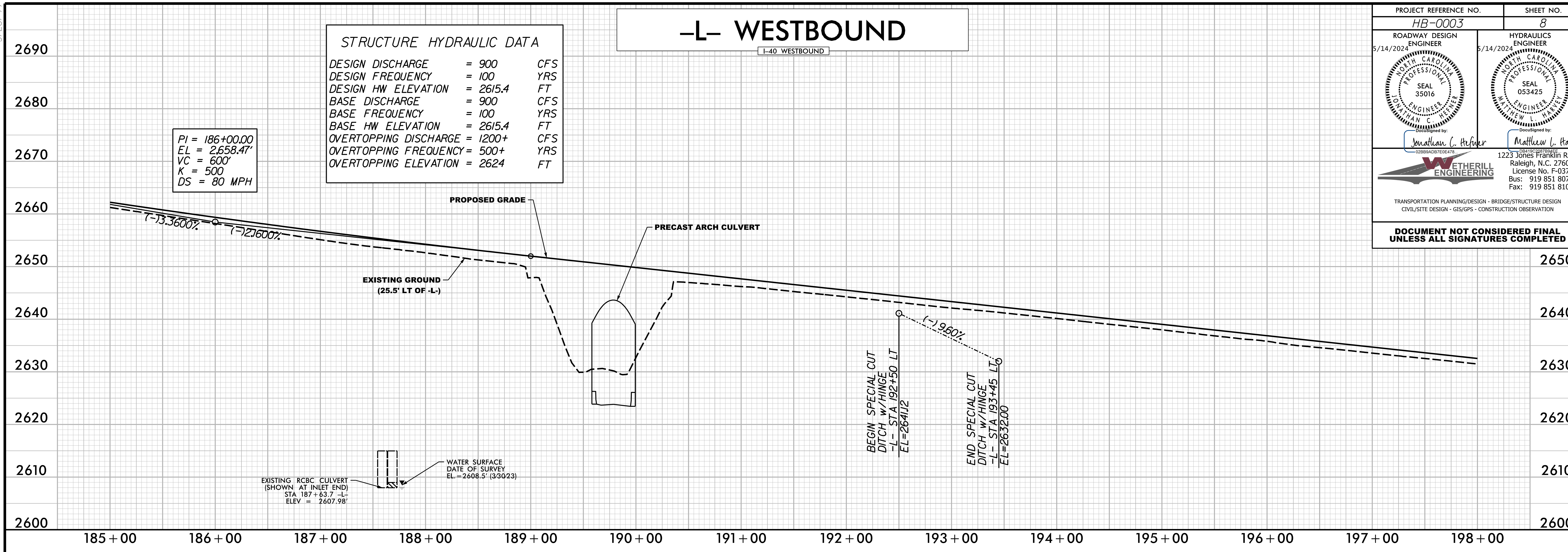
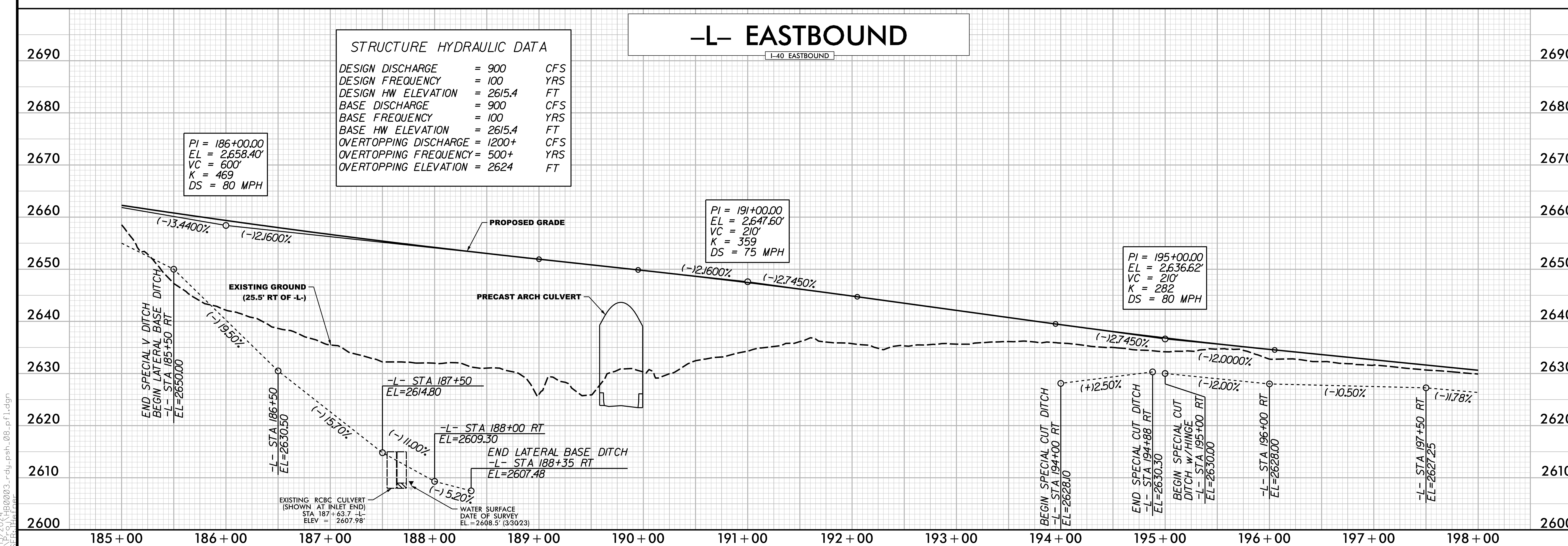

5/28/99
–L– WESTBOUND
I-40 WESTBOUND
STRUCTURE HYDRAULIC DATA
DESIGN DISCHARGE = 900 CFS
DESIGN FREQUENCY = 100 YRS
DESIGN HW ELEVATION = 2615.4 FT
BASE DISCHARGE = 900 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 2615.4 FT
OVERTOPPING DISCHARGE = 1200+ CFS
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING ELEVATION = 2624 FT
PI = 186+00.00
EL = 2,658.47'
VC = 600'
K = 500
DS = 80 MPH
(−)13.3600%
(−)2.1600%
PROPOSED GRADE
PRECAST ARCH CULVERT
EXISTING GROUND
(25.5' LT OF -L-)
(−)1.960%
BEGIN SPECIAL CUT DITCH W/HINGE -L- STA 192+50 LT EL=2641.12
END SPECIAL CUT DITCH W/HINGE -L- STA 193+45 LT EL=2632.00
EXISTING RCBC CULVERT (SHOWN AT INLET END) STA 187+63.7 -L- ELEV = 2607.98'
WATER SURFACE DATE OF SURVEY EL.=2608.5' (3/30/23)
2690 2680 2670 2660 2650 2640 2630 2620 2610 2600
185+00 186+00 187+00 188+00 189+00 190+00 191+00 192+00 193+00 194+00 195+00 196+00 197+00 198+00


–L– EASTBOUND
I-40 EASTBOUND
STRUCTURE HYDRAULIC DATA
DESIGN DISCHARGE = 900 CFS
DESIGN FREQUENCY = 100 YRS
DESIGN HW ELEVATION = 2615.4 FT
BASE DISCHARGE = 900 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 2615.4 FT
OVERTOPPING DISCHARGE = 1200+ CFS
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING ELEVATION = 2624 FT
PI = 186+00.00
EL = 2,658.40'
VC = 600'
K = 469
DS = 80 MPH
PI = 191+00.00
EL = 2,647.60'
VC = 210'
K = 359
DS = 75 MPH
PI = 195+00.00
EL = 2,636.62'
VC = 210'
K = 282
DS = 80 MPH
(−)13.4400%
(−)2.1600%
(−)2.1600%
(−)2.7450%
(−)2.7450%
(−)2.0000%
PROPOSED GRADE
EXISTING GROUND
(25.5' RT OF -L-)
PRECAST ARCH CULVERT
END SPECIAL V DITCH BEGIN LATERAL BASE DITCH -L- STA 185+50 RT EL=2650.00
(−)19.50%
-L- STA 186+50 EL=2630.50
(−)15.70%
-L- STA 187+50 EL=2614.80
(−)11.00%
-L- STA 188+00 RT EL=2609.30
(−)5.20%
END LATERAL BASE DITCH -L- STA 188+35 RT EL=2607.48
EXISTING RCBC CULVERT (SHOWN AT INLET END) STA 187+63.7 -L- ELEV = 2607.98'
WATER SURFACE DATE OF SURVEY EL.=2608.5' (3/30/23)
(+)2.50%
(−)2.00%
(−)0.50%
(−)1.78%
BEGIN SPECIAL CUT DITCH -L- STA 194+00 RT EL=2628.10
END SPECIAL CUT DITCH -L- STA 194+88 RT EL=2630.30
BEGIN SPECIAL CUT DITCH W/HINGE -L- STA 195+00 RT EL=2630.00
-L- STA 196+00 RT EL=2628.00
-L- STA 197+50 RT EL=2627.25
2690 2680 2670 2660 2650 2640 2630 2620 2610 2600
185+00 186+00 187+00 188+00 189+00 190+00 191+00 192+00 193+00 194+00 195+00 196+00 197+00 198+00

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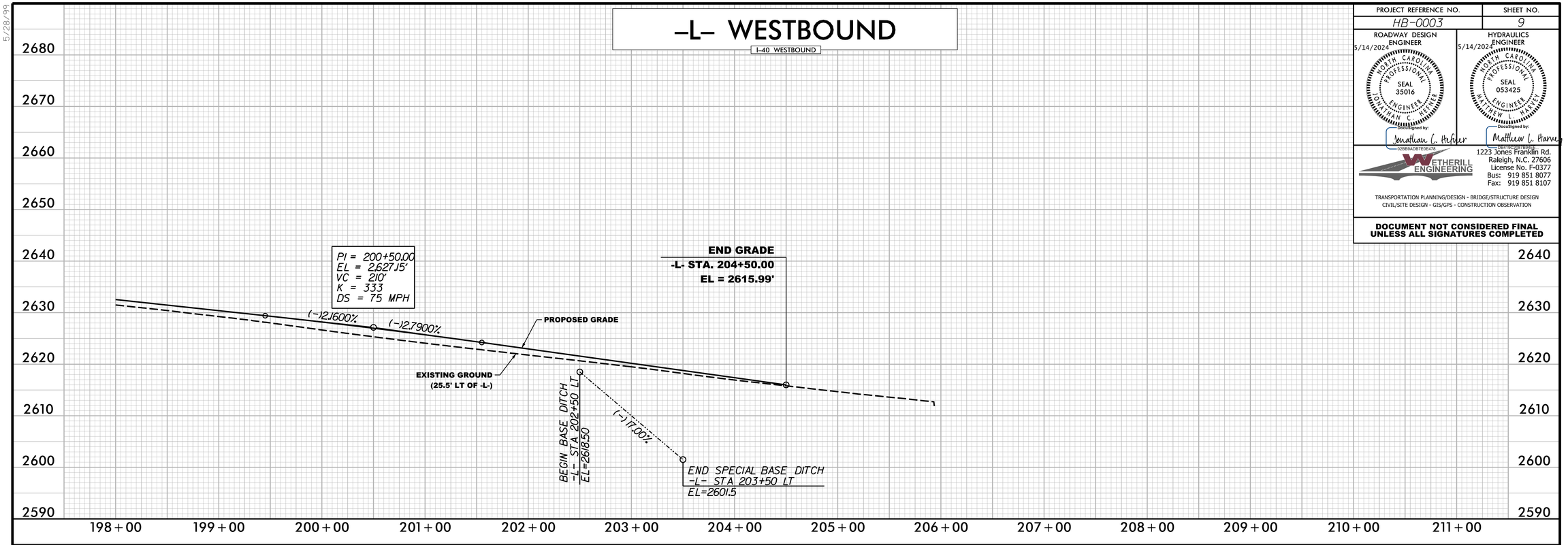
–L– WESTBOUND

I-40 WESTBOUND



PROJECT REFERENCE NO.	SHEET NO.
HB-0003	9

ROADWAY DESIGN ENGINEER
5/14/2024
NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER JONATHAN C. HEFNER
Docusigned by: Jonathan C. Hefner
02B8BADB7E9E479...

HYDRAULICS ENGINEER
5/14/2024
NORTH CAROLINA PROFESSIONAL SEAL 053425 ENGINEER MATTHEW L. HARRIS
Docusigned by: Matthew L. Harris
1BA1B9C2678B4EE...

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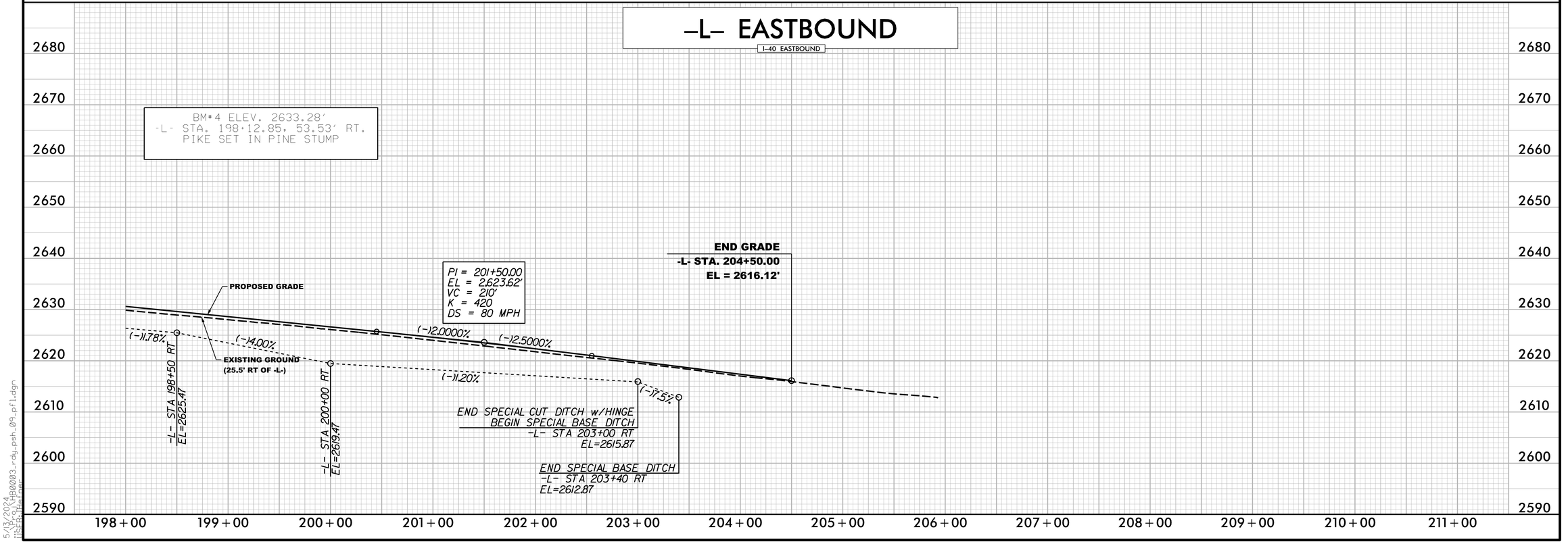
–L– EASTBOUND

I-40 EASTBOUND



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–Y1–

SR 1550 (INCINERATOR ROAD)

BM#2 ELEV. 2626.87'
-Y1- STA. 10+93.88, 20.42' LT.
SPIKE SET IN FENCE POST

BEGIN GRADE
-Y1- STA. 10+00.00
EL = 2627.33'

-Y1- UNDERPASS OF I-40
PRECAST ARCH CULVERT
174' LONG BY 36' SPAN
MINIMUM VERTICAL
CLEARANCE = 16'

BEGIN CULVERT
-Y1- STA. 12+68.00
EL = 2625.03'

END CULVERT
-Y1- STA. 14+42.00
EL = 2622.59'

END GRADE
-Y1- STA. 20+00.00
EL = 2635.33'

PI = 10+50.00
EL = 2,628.08'
VC = 100'
K = 34
DS = 45 MPH

PI = 15+50.00
EL = 2,621.08'
VC = 200'
K = 39
DS = 30 MPH

PI = 19+00.00
EL = 2,634.03'
VC = 200'
K = 83
DS = 50 MPH

END SPECIAL CUT DITCH
-Y1- STA 12+65 RT
EL=2624.43

(+)1.5000%
(–)1.4000%
(+) 0.30%
(+)1.43%
(–)1.4000%
(+)3.7000%
(+)3.7000%
(+)1.3000%

EXISTING GROUND
PROPOSED GRADE

BEGIN SPECIAL CUT DITCH
-Y1- STA 10+76.50 LT
EL=2623.78

BEGIN SPECIAL CUT DITCH
-Y1- STA 11+65 RT
EL=2623.00

END SPECIAL CUT DITCH
-Y1- STA 12+65.00 LT
EL=2624.35

BM#3 ELEV. 2631.52'
-Y1- STA. 16+49.52, 57.40' RT.
SPIKE SET IN BASE OF 28" PINE

2680 2670 2660 2650 2640 2630 2620 2610 2600 2590

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00

–DR1–

DRIVEWAY TO PARCEL 1

2690 2680 2670 2660 2650 2640 2630 2620 2610 2600

-DR1- STA. 10+00.00 =
-Y1- STA. 16+71.32
EL = 2625.57'

BEGIN GRADE
-DR1- STA. 10+11.04 =
-Y1- STA. 16+70.40, 11' RT
EL = 2626.41'

END GRADE
-DR1- STA. 11+50.00
EL = 2628.37'

PI = 10+80.00
EL = 2,631.87'
VC = 100'
K = 8
DS = 20 MPH

EXISTING GROUND
(+)7.9176%
(–)5.0000%
PROPOSED GRADE

10+00 11+00 12+00

PROJECT REFERENCE NO.	SHEET NO.
HB-0003	10

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5/14/2024
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DocuSigned by: Jonathan C. Hefner

HYDRAULICS ENGINEER
5/14/2024
NORTH CAROLINA PROFESSIONAL SEAL 053425 ENGINEER MATTHEW L. HARVEY
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